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MADRAS GOVERNMENT MUSEUM.

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THE FLOWERING PLANTS OF MADRAS CITY
AND ITS IMMEDIATE NEIGHBOURHOOD

BY

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EDITOR'S PREFACE

Everyone who takes an interest in wild flowers requires, sooner or later, to ascertain the correct names of some of them. In England this is as a rule a comparatively simple matter, for numerous books, many of them beautifully illustrated, are available for the purpose. In India few such books have yet been published; and the plants to be considered are so many and so varied, that to name them is for most people impossible.

The present volume is an attempt to meet this need so far as Madras City and its immediate surroundings are concerned. For a real interest in plants can never become general until one observer can discuss what he sees with another—for which correct naming is the only possible basis. Particularly is this the case with those who try to foster in children their natural interest in life and beauty, an interest which often leads them to a love of trees and flowers. Unfortunately the present volume cannot be a book for children. For the number of plants that it has to describe makes brief (and therefore somewhat technical) descriptions a necessity, and the species that can be illustrated relatively few. But it is hoped that parents and teachers will use it, and that in this way it may to some extent serve to provide a sound basis for the study by children of the plants they see around them. A glossary has, therefore, been included on page 317 of all the technical terms which, for the sake of brevity, have had to be used.

Soon after the preparation of this volume was started, and again when it was being put into final form for the press, Mr. Barnes, Professor of Chemistry in the Madras Christian College, acted in my place while I was on leave. Most of the work of supervising its preparation has, therefore, fallen to him. His keen interest in and knowledge of the natural history, and particularly the botany, of the district has been of the greatest value. He has given continuous help and encouragement to the author throughout his work, and as he has thus acquired a much more intimate knowledge of the manuscript than I have, he has very kindly attended to seeing it through the proof stages as well. I thank him most warmly for his help.

We have also to thank the Directors of the Royal Botanic Gardens of Kew and Calcutta and the Lecturing Botanist of the Agricultural College, Coimbatore, for help in connexion with the identification of specimens, and Mr. C. E. C. Fischer, late of the Indian Forest Service, now Assistant for India at Kew, for much personal help.

MADRAS,
July, 1929.

F. H. GRAVELY,
Superintendent, Government Museum.

INTRODUCTION

This book has been prepared with the object of helping the non-specialist to identify the flowering plants of the neighbourhood of Madras City. Grasses have had to be omitted, as is usual in such works, on account of the minute size of their flowers and the great difficulties that they consequently present. Anyone wishing to study them may be referred to "Handbook of South Indian Grasses" (Madras, Government Press, 1921) by K. Rangachari and C. Tadulinga Mudaliyar.

The first part consists of a dichotomous key by the use of which the family or, in some cases, the genus of the plant may be found. After this there follow the general characters of families and genera and the distinguishing characters of the species. Where there are a number of genera in a family or a number of species in a genus, subsidiary keys are given. The keys are based on the natural system of classification but in many details this has been abandoned for more convenient distinctions. It will be obvious, therefore, that the characters used in the key have not been limited to any one phase of the plant and, consequently, it is necessary in many cases to have the leaf, flower and fruit before identification is possible. As all parts of the plant are not usually found at the same time of year, there may be some delay in coming to a conclusion. It is hoped that this inconvenience will be compensated by the stimulus thus given to further observation and by the acquaintance with the general scheme of the natural system of classification that the user will gain.

The region covered includes not only the City of Madras but the country round it for several miles. Plants found at Ennur, Avadi, Pallavaram, Vandalur and Covelong have also been included as these places are available for excursions involving only a few hours absence from Madras and are frequently visited by botanical students from the various colleges in the city.

Some difficulty has been experienced in deciding what cultivated or introduced plants should be included in this book. Many of the commonest trees and shrubs found in the city are not indigenous, and not less than seventy foreign weeds have run wild. There appears to be a certain amount of change taking place in the flora of this region, and it is evident that such a change has been in progress for some years; a number of plants observed a few years ago are no longer to be met with, while others from foreign countries or from other parts of India are establishing themselves. All wild plants that have been recorded for the area

have been included whether the author has found them himself or not; in the cases of the few plants not observed by the author, the authority is quoted. All self-seeding plants have been included in the keys together with a few of the commonest and best known cultivated plants. Some additional introduced plants are included among the descriptions, but not in the keys. Most, however, have had to be omitted altogether.

As this publication is intended for the non-specialist, the use of technical terms has been restricted as far as possible. For the sake of brevity and clearness, the use of a number of technical terms has been found necessary. All these terms are defined in the glossary at the end of the text (page 317).

In the case of some very small flowers and also in the case of small parts of flowers, difficulty may be experienced in making out the number and nature of the parts. It is hoped that with the help of a razor, a dissecting-needle and a hand-lens, and after some experience, the student will be able to make the observations necessary for using the keys.

The keys will be found to consist of a series of pairs of alternatives. To use them for identifying a plant, first see with which of the first pair of alternatives the plant agrees, i.e., whether it belongs to the group of Dicotyledons or to the Monocotyledons. Next, consider the first pair of alternatives given for whichever group has thus been arrived at. Suppose it is a Dicotyledon; it must then be either an Angiosperm or a Gymnosperm. If the former, see if the flowers are simple. If so the number "3" is the next to be considered. If on the contrary they are composite the number "2" at the end of the line indicates that the pair numbered "2" is the next to be considered. And so on till the family, the genus and the species has been arrived at. Finally, this should be checked by a comparison of the plant with the brief description given on the page indicated beside the name in the key.

It is realized that, with so large a flora, many further observations as to the occurrence of species within the area remain to be made. Also, in some cases, more convenient distinctions for use in the keys may be suggested. Any such observations or suggestions will be welcomed for inclusion in subsequent issues. In the case of species found growing wild in the region but not recorded in this book, it is very desirable that living or well-preserved specimens should be sent to the Museum along with notes as to place of occurrence, time of flowering and other details.

KEY TO FAMILIES AND ABERRANT GENERA

- Seed with 2 lobes (cotyledons); leaves net-veined; parts of the flower usually in fours or fives Dicotyledons, p. 3.
- Seed with a single lobe; leaves usually parallel-veined; parts of the flower in threes or sixes, never in fives Monocotyledons, p. 16.

Dicotyledons

- Ovules enclosed in an ovary, and the seeds in a seed-vessel ... Angiosperms, p. 3.
- Ovules naked, not enclosed in an ovary Gymnosperms, p. 16.

Angiosperms

- 1 Flowers simple... .. 3
- Flowers composite. (Numerous flowers densely packed together within a ring of bracts or a cup-shaped involucre and apt to be mistaken for a single flower) 2
- 2 Flowers massed in dense heads and enclosed in a ring of bracts, either all 2-sexual or some or all 1-sexual; calyx represented by bristles or scales, or sometimes absent; corolla always present (absent in the female flowers of *Xanthium*); ovary inferior, 1-celled Compositae, p. 149.
- Flowers packed in a cup-like 4-to 5-lobed involucre resembling a perianth and often bearing 5 petal-like limbs; calyx or corolla absent; male flowers many, each represented by a single, stalked stamen and arranged around a solitary female flower in the centre which is represented by a 3-celled ovary carried on a stalk; milky juice always present Euphorbia (Euphorbiaceae), p. 258.
- 3 Petals and sepals present 4
- Petals absent, or if present not distinguishable from sepals... Apetalae, p. 13.
- 4 Petals free (except in the male flowers of Papayaceae) ... Polypetalae, p. 4.
- Petals united Sympetalae, p. 9.

Polypetalae

1	Ovary inferior	2
	Ovary superior	12
2	Ovary 1-celled	3
	Ovary more than 1-celled	8
3	Plants fleshy	4
	Plants not fleshy	5
4	Stem fleshy; leaves represented by tufts of spines, prickles or small tubercles; sepals 3 or more; petals many; fruit a berry	Cactaceae, p. 134.
	Leaves fleshy; sepals 2; petals 4; fruit a capsule	Portulacaceae, p. 32
5	Fruit containing a single seed (more than one ovule may be present in the ovary)	6
	Fruit containing many seeds	7
6	Ovules 4-10; petals 4-10, thickened and curved backwards	Alangiaceae, p. 141.
	Ovules single; petals not bent backwards	Combretaceae, p. 113
7	Climbers with tendrils; flowers 1-sexual; stamens 3; one anther 1-celled and the others 2-celled	Cucurbitaceae, p. 126.
	Non-climbers; flowers 2-sexual; stamens 5 or 10	Saxifragaceae, p. 111.
8	Stamens few (less than 10)	9
	Stamens many	10
9	Flowers arranged in simple or compound umbels; leaf-stalks with sheathing bases; fruit separating into 2 dry, 1-seeded parts	Umbelliferae, p. 140.
	Flowers arranged in spikes or racemes or standing singly; leaf-stalks not having sheathing-bases; fruit a capsule or a hard nut	Onagraceae, p. 123.
10	Leaves opposite, dotted with oil-glands	Myrtaceae, p. 115
	Leaves alternate, not dotted with oil-glands	11

- | | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----|------------------------------------|
| 11 Prickly shrubs; leaves pinnately compound; carpels numerous, lodged at the bottom of the calyx which becomes fleshy in fruit | ... | ... | ... | ... | ... | ... | ... | Rosa (Rosaceae),
p. 110. |
| Trees, not prickly; leaves simple, crowded at the ends of branches; ovary 2-to 5-celled; fruit a woody or fleshy berry. | | | | | | | | Lecythidaceae,
p. 117. |
| 12 Ovary 1-celled | ... | ... | ... | ... | ... | ... | ... | 13 |
| Ovary more than 1-celled or consisting of more than one independent carpel each developing into a fruit or massed together into a collective fruit | ... | ... | ... | ... | ... | ... | ... | 27 |
| 13 Ovules arranged along one side of the ovary; style arising somewhat from one side of the ovary; fruit, as a rule, splitting along both the upper and under edges, sometimes separating into 1-seeded parts and sometimes not breaking open. | | | | | | | | Leguminosae.
p. 74. |
| Ovules not arranged as above; style, if present, arising from the summit of the ovary; fruit not splitting on both sides | | | | | | | | 14 |
| 14 Petals equal in size | ... | ... | ... | ... | ... | ... | ... | 15 |
| Petals unequal in size | ... | ... | ... | ... | ... | ... | ... | 26 |
| 15 Leaves opposite | ... | ... | ... | ... | ... | ... | ... | 16 |
| Leaves alternate | ... | ... | ... | ... | ... | ... | ... | 18 |
| 16 Herbs; nodes swollen; ovules attached to a free central axis inside the ovary | ... | ... | ... | ... | ... | ... | ... | Caryophyllaceae,
p. 32. |
| Trees or shrubs | ... | ... | ... | ... | ... | ... | ... | 17 |
| 17 Stamens numerous | ... | ... | ... | ... | ... | ... | ... | Guttiferae, p. 34. |
| Stamens 8 | ... | ... | ... | ... | ... | ... | ... | Memecylon (Melastomaceae), p. 118. |
| 18 Leaf-edges beset with long glandular hairs which entrap insects | ... | ... | ... | ... | ... | ... | ... | Droseraceae,
p. 112. |
| Leaf-edges not beset with long glandular hairs | ... | ... | ... | ... | ... | ... | ... | 19 |
| 19 Plants with milky or coloured juice | ... | ... | ... | ... | ... | ... | ... | 20 |
| Plants without milky or coloured juice | ... | ... | ... | ... | ... | ... | ... | 21 |
| 20 Trees; flowers 1-sexual; stamens 10; juice milky | ... | ... | ... | ... | ... | ... | ... | Caricaceae, p. 125. |
| Herbs; flowers 2-sexual; stamens numerous; juice usually coloured | ... | ... | ... | ... | ... | ... | ... | Papaveraceae,
p. 25. |

- 21 Tendril-climbers; corona of slender segments forming a cup
inside the petals; ovary carried on a stalk Passifloraceae,
p. 125.
Tendrils absent 22
- 22 Ovary carried on a stalk (except in Cleome); style absent;
sepals and petals 4 each Capparidaceae,
p. 26.
Ovary not carried on a stalk; style present 23
- 23 Stamens as many as the petals and alternating with them (or
fewer as in the mango or occasionally twice as many) ... 24
Stamens as many as the petals and opposite to them; sterile
stamens may be present between them 25
- 24 Flowers small; ovules single; plants abounding in resinous or
acid juice; fruit a drupe or a nut Anacardiaceae,
p. 71.
Flowers showy; ovules many; resinous or acid juice absent;
fruit a capsule Turneraceae,
p. 124.
- 25 Sterile stamens present between the perfect stamens ... Olacaceae, p. 63.
Sterile stamens absent Opiliaceae, p. 64.
- 26 Trees; leaves opposite, thrice pinnately compound; sepals
coloured like the petals; anthers 1-celled; fruit an elong-
ated beaked capsule Moringaceae,
p. 73.
Herbs; leaves alternate; sepals not coloured like the petals;
anthers 2-celled, the connective part of anther produced
beyond the anther-cells; capsule not elongated or beaked ... Violaceae, p. 30.
- 27 Ovary consisting of 2 or more cells 28
Ovary consisting of a number of carpels distinct from each
other each developing into a fruit or getting united at
maturity to form a globose many-seeded fruit 49
- 28 Stamens united into a tube, column or ring 29
Stamens free (except in some of the Geraniaceae where they are
slightly united at base or in a few of the Menispermaceae
which can be easily identified by their climbing habit
and the male and female flowers being arranged on separate
plants) 33

- 29 Sepals of unequal size; petals also unequal Polygalaceae,
p. 31.
Sepals equal; petals equal 30
- 30 Leaves simple or palmately compound; stipules always
present; younger parts covered with soft minute hairs;
inner bark fibrous and slimy 31
Leaves simple or pinnately compound; stipules absent
(except in Hugonia which has a pair of spiral hooks
beneath the flowers); younger parts not covered with
soft minute hairs; inner bark not fibrous and slimy ... 32
- 31 Anthers kidney-shaped, 1-celled, opening along the top;
a whorl of bracteoles often present beneath the flower
forming a sort of exterior calyx Malvaceae, p. 35.
Anthers not kidney-shaped, 2-celled, opening lengthwise;
exterior calyx absent Sterculiaceae,
p. 48.
- 32 Leaves pinnately compound Meliaceae, p. 62.
Leaves simple; petals soon falling Linaceae, p. 55.
- 33 Sepals equal; petals equal 34
Sepals unequal, coloured like the petals, one sepal prolonged
backwards into a spur; petals unequal Impatiens
(Geraniaceae),
p. 56.
- 34 Leaves having many oil-glands Rutaceae, p. 58.
Leaves having no oil-glands 35
- 35 Stamens as many as the petals and opposite to them ... 36
Stamens as many as the petals and alternating with them,
twice as many or more numerous 38
- 36 Male and female flowers on separate plants; twiners or woody
climbers; sepals and petals in threes or multiples of
three Menispermaceae,
p. 22.
Flowers bisexual (if unisexual, male and female flowers on
the same plant); sepals and petals not in threes or multiples
of three 37
- 37 Climbing shrubs with tendrils opposite the leaves; leaf-stalk
thickened at the base Vitaceae, p. 67.
Trees or shrubs, sometimes climbers; tendrils rarely present
and if present never opposite the leaves; leaf-stalk
not thickened at the base; flowers greenish Rhamnaceae,
p. 65.

38	Stamens many	...	...	...	...	...	...	39
	Stamens few	...	...	...	...	...	...	42
39	Water-plants; leaves and flowers floating or standing above the water; flowers growing singly; petals many	...	...	...	...	...	...	Nymphaeaceae, p. 24.
	Land-plants	...	...	...	...	...	...	40
40	Leaves opposite; petals 6, furnished with stalks, wrinkled, margins crispate, inserted at the summit of the calyx- tube	...	...	...	...	...	...	Lagerstroemia (Lythraceae), p. 121.
	Leaves alternate; petals 5, not stalked, not wrinkled, margins not crispate	..	...	...	...	...	...	41
41	Leaves having 3-7 nerves radiating from the base; young branches and leaves covered with soft minute hairs; fruit a capsule or a drupe	...	...	...	...	...	...	Tiliaceae, p. 51.
	Leaves usually large with sheathing petioles and often having parallel lateral nerves; younger branches and leaves not covered with soft minute hairs; fruit fleshy	..	...	...	...	...	...	Dillenia (Dilleniaceae), p. 19
42	Leaves opposite	...	...	...	...	...	...	43
	Leaves not opposite	...	...	...	...	...	...	46
43	Leaves 3-to 7-nerved from the base	...	...	...	...	...	...	Osbeckia (Melastomaceae), p. 118.
	Leaves with a main midrib	...	...	...	...	...	...	44
44	Leaves compound	...	...	...	...	...	...	Zygophyllaceae, p. 56.
	Leaves simple	...	...	...	...	...	...	45
45	Stipules present; stamens inserted below the ovary	...	...	...	...	...	...	Elatinaceae, p. 33.
	Stipules absent; stamens inserted on the calyx-tube	...	...	...	...	...	...	Lythraceae, p. 119.
46	Stamens 6, the 4 inner ones longer than the 2 outer; petals 4, arranged in the form of a cross	...	...	...	...	...	...	Cruciferae, p. 25.
	Stamens never 6, all equal; petals usually 5, not arranged in the form of a cross even when only 4 are present	47

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|----|---|-----|-----|-----|-----|-----|-----|--|
| 47 | Ovary 5-celled ; styles 5 | ... | ... | ... | ... | ... | ... | Geraniaceae,
p. 56. |
| | Ovary 2- or 3-celled | ... | ... | ... | ... | ... | ... | 48 |
| 48 | Leaves simple ; stamens 4 or 5 | ... | ... | ... | ... | ... | ... | Celastraceae,
p. 64. |
| | Leaves compound ; stamens usually 8 | ... | ... | ... | ... | ... | ... | Sapindaceae,
p. 69. |
| 49 | Carpels uniting in fruit | ... | ... | ... | ... | ... | ... | Anona
Anonaceae), p.
20. |
| | Carpels not uniting in fruit | ... | ... | ... | ... | ... | ... | 50 |
| 50 | Water-plants ; ovaries sunk in depressions on the flat top of
a much-enlarged receptacle | ... | ... | ... | ... | ... | ... | Nelumbium
(Nymphaeaceae),
p. 25. |
| | Land-plants | ... | ... | ... | ... | ... | ... | 51 |
| 51 | Flowers unisexual ; male and female flowers on separate
plants | ... | ... | ... | ... | ... | ... | Menispermaceae,
p. 22. |
| | Flowers bisexual | ... | ... | ... | ... | ... | ... | 52 |
| 52 | Sepals 5 | ... | ... | ... | ... | ... | ... | Ochnaceae, p. 62. |
| | Sepals 3 | ... | ... | ... | ... | ... | ... | 53 |
| 53 | Sepals brightly coloured and as large as petals | ... | ... | ... | ... | ... | ... | Magnoliaceae, p. 19. |
| | Sepals not coloured and smaller than petals | ... | ... | ... | ... | ... | ... | Anonaceae, p. 20. |

Sympetalae

- | | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-----|--|
| 1 | Ovary inferior | ... | ... | ... | ... | ... | ... | 2 |
| | Ovary superior | ... | ... | ... | ... | ... | ... | 5 |
| 2 | Leaves opposite | ... | ... | ... | ... | ... | ... | 3 |
| | Leaves alternate | ... | ... | ... | ... | ... | ... | 4 |
| 3 | Stipules present or represented by a scar, the 2 stipules of
each side united into one and placed between the leaf-
stalks ; ovary with 2 or more cells | ... | ... | ... | ... | ... | ... | Rubiaceae, p. 142. |
| | Stipules absent ; calyx-tube produced above the ovary ; ovary
1-celled | ... | ... | ... | ... | ... | ... | Quisqualis
(Combretaceae),
p. 115. |

- 4 Tendril-climbers; flowers 1-sexual; stamens 3, two 2-celled
and the third 1-celled Cucurbitaceae,
p. 126
- Erect herbs or shrubs; flowers 2-sexual; stamens 5, all 2-
celled; ovary 2-to 5-celled Campanulaceae,
p. 160.
- 5 Ovary 1-celled 6
Ovary with more than 1 cell or consisting of 4 or 2
independent carpels not joined to each other 11
- 6 Stamens as many as the corolla-lobes and standing opposite
to them 7
Stamens as many as or fewer than the corolla-lobes and not
opposite to them 9
- 7 Male and female flowers on separate plants; climbing shrubs;
anthers united; female flowers having only 1 sepal and 1
petal Cissampelos
(Menispermaceae), p. 22.
- Flowers 2-sexual; climbing habit not present 8
- 8 Herbs or low shrubs; calyx with 5-10 ridges; ovules single... Plumbaginaceae,
p. 161.
Trees or tall shrubs; calyx not ridged; ovules few or many... Myrsinaceae,
p. 161.
- 9 Corolla 2-lipped and produced backwards into a spur; stamens
2; aquatic or marsh plants Lentibulariaceae,
p. 210
Corolla not 2-lipped; stamens 4 or 5 10
- 10 Shrubs or trees; ovules 1 or 2 Salvadoraceae,
p. 167.
Herbs; ovules many Gentianaceae,
p. 182.
- 11 Calyx-tube much inflated, cylindrical; leaves fleshy; ovary of
4 independent carpels Bryophyllum
(Crassulaceae),
p. 111.
- Calyx-tube not inflated; leaves not fleshy ovary 2-celled
or consisting of 2 independent carpels 12

- 12 Corolla-lobes alike 13
 Corolla-lobes unlike (almost alike in a few of the Acanthaceae where the corolla stands obliquely or in some of the Bignoniaceae and Scrophulariaceae where the corolla is 2-lipped) 26
- 13 Leaves opposite or whorled 14
 Leaves alternate 21
- 14 Stipules, stipular membrane or line present between the leaves Loganiaceae, p. 181.
 Stipules absent 15
- 15 Stamens 2 Oleaceae, p. 165.
 Stamens 4 or 5 16
- 16 Corolla-lobes and stamens 4 each 17
 Corolla-lobes and stamens 5 each 19
- 17 Throat of corolla bearded: leaves serrate Scoparia (Scrophulariaceae), p. 206.
 Throat of corolla not bearded; leaves entire 18
- 18 Thorny shrubs; male and female flowers on separate plants; calyx 4-toothed Azima (Salvadoraceae), p. 167.
 Small trees, not thorny; flowers 2-sexual; calyx 5-partite but corolla with 4 lobes that are nearly equal Avicennia (Verbenaceae), p. 226.
- 19 Leaves with 3 or more ribs starting from the base Exacum (Gentianaceae), p. 183.
 Leaves with a single median rib starting from the base 20
- 20 Styles 2; stigmas united; stamens with fleshy scales or processes on the back (except in Hemidesmus where the petals are fleshy and in Cryptostegia which has a funnel-shaped corolla) Asclepiadaceae, p. 174.
 Styles single; stamens without scales or processes on the back of anthers Apocynaceae, p. 168.

- | | | | | | | | |
|----|---|-----|-----|-----|-----|-----|--------------------------|
| 21 | Flowers 1-sexual; male and female flowers on separate plants; trees or shrubs | ... | ... | ... | ... | ... | Ebenaceae, p. 163. |
| | Flowers 2-sexual | ... | ... | ... | ... | ... | 22 |
| 22 | Stamens as many as the corolla-lobes and opposite to them or 2 or 3 times as many; milky juice usually present; seeds with shiny outer covering | ... | ... | ... | ... | ... | Sapotaceae, p. 162. |
| | Stamens as many as corolla-lobes and alternating with them; milky juice usually absent (except in a few of the Convolvulaceae) | ... | ... | ... | ... | ... | 23 |
| 23 | Ovules in the ovary 4, occasionally 6 | ... | ... | ... | ... | ... | 24 |
| | Ovules numerous | ... | ... | ... | ... | ... | 25 |
| 24 | Corolla spirally folded in the bud, funnel- or bell-shaped; mostly twining plants | ... | ... | ... | ... | ... | Convolvulaceae, p. 190. |
| | Corolla not spirally folded in the bud; lobes imbricate and spreading; leaves and younger branches often rough with coarse hairs; throat of corolla-tube often filled with scales; twining habit absent | ... | ... | ... | ... | ... | Boraginaceae, p. 184. |
| 25 | Corolla-lobes imbricate; styles 2 | ... | ... | ... | ... | ... | Hydrophyllaceae, p. 184. |
| | Corolla-lobes often pleated; lobes valvate; styles single | ... | ... | ... | ... | ... | Solanaceae, p. 199. |
| 26 | Seeds winged; fertile stamens 4, an imperfect fifth also present; trees or shrubs | ... | ... | ... | ... | ... | Bignoniaceae, p. 211. |
| | Seeds not winged; stamens 4 or 2 | ... | ... | ... | ... | ... | 27 |
| 27 | Style rising from between the 4 lobes of the ovary; leaves generally scented; fruit made up of 4 dry 1-seeded parts | ... | ... | ... | ... | ... | Labiatae, p. 231. |
| | Style rising from the apex of the ovary; leaves not scented usually; fruit not made up of 4 dry 1-seeded parts (In Lippia fruit is made up of 2 dry 1-seeded parts) | ... | ... | ... | ... | ... | 28 |
| 28 | Seeds attached to hard recurved stalks which cause the fruit to burst open when wetted; nodes usually swollen; bracts and bracteoles prominent | ... | ... | ... | ... | ... | Acanthaceae, p. 214. |
| | Seeds not attached to hard recurved stalks | ... | ... | ... | ... | ... | 29 |
| 29 | Ovules in the ovary not more than 4 | ... | ... | ... | ... | ... | 30 |
| | Ovules in the ovary numerous | ... | ... | ... | ... | ... | 32 |

- 30 Twining plants; bracts leaf-like; bracteoles large Thunbergia
(Acanthaceae),
p. 215.
Twining habit absent 31
- 31 Flowers standing singly in the axils of leaves; fruit spiny ... Pedalium
(Pedaliaceae),
p. 213.
Flowers arranged in cymes, spikes or panicles; fruit not
spiny Verbenaceae,
p. 225.
- 32 Ovules discoid and arranged one above the other like a pile of
coins Pedaliaceae,
p. 212.
Ovules not arranged as above Scrophulariaceae,
p. 205.

Apetalae

- 1 Submerged water-plants; leaves very much dissected and
arranged in whorls Ceratophyllaceae,
p. 276.
Land-plants 2
- 2 Flowers minute, crowded together inside a round or oval
receptacle which is liable to be mistaken for a fruit ... Ficus
(Moraceae), p. 272.
Flowers not massed inside a receptacle and not likely to be
mistaken for a fruit 3
- 3 Trees with green, slender, cylindrical, ultimate branchlets
which fall off on drying; leaves reduced to scale-like
sheaths at the nodes; flowers minute, unisexual; male
flowers in slender spikes; female flowers in round heads ... Casuarinaceae,
p. 276.
Not as above 4
- 4 Perianth altogether absent Piperaceae, p. 253.
Perianth present 5
- 5 Ovary inferior 6
Ovary superior 10
- 6 Two halves of leaves unequal; flowers brightly coloured and
arranged in branching cymes; ovary 2- to 4-celled ... Begoniaceae,
p. 134.
Two halves of leaves equal 7

- 7 Leaves alternate; perianth curious in shape; erect or climbing herbs Aristolochiaceae, p. 252.
- Leaves opposite 8
- 8 Shrubs fixed on branches of trees and not capable of independent existence; stamens as many as perianth-lobes and standing opposite to them; leaves sometimes absent and the stems jointed Loranthaceae, p. 255.
- Trees 9
- 9 Perianth-tube completely adherent to the ovary; stamens usually twice as many as the perianth-lobes Combretaceae, p. 113.
- Perianth-tube partially adherent to the ovary; stamens as many as and adhering to the bases of the perianth-lobes Santalum (Santalaceae), p. 255.
- 10 Ovary 1-celled 11
- Ovary more than 1-celled 22
- 11 Bracts large, leaf-like, purple or magenta-coloured, rendering the inflorescence highly conspicuous; a thorny shrub Bougainvillea (Nyctaginaceae), p. 237.
- Bracts not prominent and not coloured 12
- 12 Stamens numerous; male and female flowers on separate plants Flacourtia (Bixaceae), p. 30.
- Stamens as many, twice as many or, occasionally, 3-4 times as many as the perianth-lobes 13
- 13 Stamens 2, 3 or 4 times as many as the perianth-lobes 14
- Stamens as many as the perianth-lobes 15
- 14 Stamens 3 or 4 times as many as the perianth-lobes; shrubs or trees with aromatic leaves or leafless climbers Lauraceae, p. 254.
- Stamens twice as many as the perianth-lobes; leaves opposite. Thymeliaceae, p. 255.
- 15 Perianth and bracts chaffy or scale-like Amarantaceae, p. 238.
- Perianth usually greenish; bracts not chaffy or scale-like 16

- 16 Stamens as many as the perianth-lobes and opposite to them 17
 Stamens as many as the perianth-lobes and alternating with them 19
- 17 Leaves having stipules 18
 Leaves without stipules ; more or less succulent herbs ... Chenopodiaceae,
 p. 247.
- 18 Plants with milky juice Moraceae, p. 271.
 Plants without milky juice Urticaceae, p. 275.
- 19 Trees ; leaves pinnately divided (or entire) Proteaceae, p. 254.
 Herbs, rarely shrubs 20
- 20 Leaves opposite ; perianth coloured Nyctaginaceae,
 p. 237.
 Leaves alternate 21
- 21 Stipules forming a sheath at the base of the leaf ; fruit a small nut Polygonaceae,
 p. 251.
 Stipules absent ; fruit a berry ; perianth often coloured ... Phytolaccaceae,
 p. 250.
- 22 Stamens united into a column ; fruit a follicle ; trees Sterculia
 (Sterculiaceae),
 p. 48.
 Stamens free 23
- 23 Fruit winged ; a shrub Dodonaea
 (Sapindaceae),
 p. 70.
 Fruit not winged 24
- 24 Flowers 1-sexual ; ovary 3-celled as a rule Euphorbiaceae,
 p. 256.
 Flowers 2-sexual 25
- 25 Trees or shrubs of sea-side places ; stamens numerous ; filaments of stamens bent inwards in bud Sonneratiaceae,
 p. 122.
 Herbs 26
- 26 Calyx of 5 sepals Aizoaceae, p. 136.
 Calyx tubular with 4 triangular teeth Ammannia
 (Lythraceae),
 p. 120.

Gymnosperms

Palm-like trees. Male and female flowers on separate plants, without perianth, arranged on flat, thick, scale-like leaves grouped in cones. The only family of this class represented in the wild state in this area

Cycadaceae,
p. 277.

Monocotyledons

- 1 Very minute plants without differentiated stem or leaves and floating on the surface of water like a green scum ... Lemnaceae, p. 300.
- Plants with stems and leaves, the latter sometimes scale-like. 2
- 2 Perianth absent, or if present reduced to a few bristles or scales ... 3
- Perianth present ... 8
- 3 Trees or shrubs; stems supported by stilt-roots; leaves usually beset with thorns on the margins and on the midrib ... Pandanaceae, p. 297.
- Herbs or rarely shrubs; stilt-roots absent; leaves not beset with thorns ... 4
- 4 Plants growing under salt water; leaves linear... Ruppia (Naiadaceae), p. 302.
- Land-plants (if water-plants not growing in salt water) ... 5
- 5 Inflorescence a spadix ... Araceae, p. 298.
- Inflorescence not a spadix ... 6
- 6 Flowers arranged inside imbricate husk-like scales (glumes); grass-like plants ... 7
- Flowers not arranged inside husk-like scales but in large cylindrical spikes, either all male or all female ... Typhaceae, p. 298.
- 7 Stem triangular, solid; sheath-like bases of leaves not split; leaves arranged in three ranks; no line of hairs or flap present at the junction of the leaf-blade with the sheath. Cyperaceae, p. 304.
- Stem round, hollow; sheath-like bases of leaves split; leaves arranged in two ranks; a line of hairs or flap present at the junction of the leaf-blade with the sheath ... Graminaceae, (See Introduction), p. 1.

- | | |
|--|------------------------------|
| 8 Ovary inferior | 10 |
| Ovary superior | 14 |
| 9 Perianth-segments equal | 10 |
| Perianth-segments very unlike | 13 |
| 10 Twining plants ; male and female flowers on separate plants
and arranged in profuse spikes | Dioscoriaceae,
p. 285. |
| Twining habit absent... .. | 11 |
| 11 Water-plants ; flowers I-sexual and enclosed by a spathe | Hydrocharitaceae,
p. 278. |
| Land-plants | 12 |
| 12 Flowers arranged in umbels or standing singly in the axil of
a spathe on a leafless axis | Amaryllidaceae,
p. 283. |
| Flowers arranged in dense spikes standing above a rosette of
fleshy leaves... .. | Bromeliaceae,
p. 282. |
| 13 Stamens single (rarely 2), coalescent with the style so as to
form a column, their pollen cohering in masses ; seeds
minute, innumerable | Orchidaceae,
p. 280. |
| Only one stamen fertile (or at times 5), not united with the
style, their pollen not cohering in masses ; sterile stamens
resembling petals present ; herbs, often large, having a
stem made of leaf-sheaths | Scitamineae,
p. 282. |
| 14 Unbranched trees or shrubs ; leaves cut pinnately or palmately
and folded in the bud | Palmaceae, p. 294. |
| Herbs or, very rarely, branched shrubs | 15 |
| 15 Flowers densely aggregated in a spherical or hemispherical
head at the top of an axis which has a tuft of grass-like
leaves at its base | 16 |
| Flowers not aggregated into the form of a head | 17 |
| 16 Flowers bisexual ; petals yellow ; ovules numerous | Xyridaceae, p. 290. |
| Flowers unisexual, usually appearing grey due to short white
hairs ; petals not yellow ; ovules one in each cell of the
ovary | Eriocaulaceae,
p. 303. |

17	Land-plants	...	...	...	...	...	...	...	18
	Water- or marsh-plants	...	...	...	...	...	...	...	19
18	Perianth divisible into three thin sepals and three coloured petals	...	...	...	...	...	...	...	Commelinaceae, p. 291.
	Perianth-segments all coloured alike	...	...	...	...	...	...	...	Liliaceae, p. 286.
19	Perianth-segments 2-4; flowers inconspicuous	...	...	...	...	...	...	...	Naiadaceae, p. 302.
	Perianth-segments 6; flowers showy	...	...	...	...	...	...	...	20
20	Perianth-segments differentiated into sepals and petals; ovary consisting of 3 or more independent carpels each becoming a fruit	...	...	...	...	...	...	...	Alismaceae, p. 301.
	Perianth-segments all coloured alike; ovary 3-celled	...	...	...	...	...	...	...	Pontederiaceae, p. 289.

POLYPETALAE

Dilleniaceae

Trees (shrubs or herbs). Leaves alternate, simple. Flowers yellow or white, usually very large. Petals 5, soon falling. Stamens numerous. Carpels few or numerous, free or joined together.

Dillenia, Linn.

Trees. Leaves large, with conspicuous nerves. Flowers large, standing singly or in few-flowered racemes or clusters. Sepals 5, spreading. Petals 5, broad. Stamens joined slightly at the base. Carpels 5-20, joined. Ovules numerous. Fruit globose, consisting of the matured carpels and the thickened fleshy calyx that envelops it.

Dillenia bracteata, Wt.

A medium-sized tree. Twigs covered with silky hairs. Leaves oblong-lanceolate, blunt at base, crenate, minutely hairy on the nerves, 3-8 in. long. Flowers in few-flowered racemes at the ends of branches, 2½ in. in diameter. Petals broadly obovate, white. Flower-stalks covered with silky hairs. Fruit covered and concealed by the fleshy calyx, about 1 in. in diameter. Flowers in May and June.

Abundant on the Kambakkam Hills. According to Mr. Fischer this species occurs on hills over 1,000 feet above sea level. At Vandalur it grows at a height of not more than 300 feet above sea level.

Dillenia indica, Linn. (*Dillenia speciosa*, Thunb.)

செடிக

A medium-sized tree. Leaves large, oblong, glabrous, serrate, about 1 foot long. Flowers large, white, 6 in. in diameter, standing singly at the ends of branches. Fruit large, round, enclosed in a fleshy calyx. Flowers in August and September. A native of the Western Ghats and the damp valleys of the hills of Northern Circars, often grown in gardens. There is a specimen in the Museum compound. It grows in the People's Park and in the Agri-Horticultural Society's Garden.

Magnoliaceae

Evergreen trees (or shrubs). Leaves alternate. Flowers showy and fragrant. Sepals and petals similar, arranged in whorls of 3. Stamens very numerous. Carpels usually cohering to an elongated axis. Fruit usually a dense spike of leathery carpels breaking open along the back.

Michelia, Linn.

Same characters as the family.

Michelia champaca, Linn. The Champak

சண்பகம் చంపకము

A tall tree. Leaves lanceolate, entire, glabrous, 7-10 in. long. Flowers very fragrant, yellow or orange, $1\frac{1}{2}$ - $2\frac{1}{2}$ in. long. Occasionally cultivated in gardens. It is a native of the Western Ghats. The variety cultivated in Madras has white flowers and is obtained by grafting. The petals are much larger but less fragrant than in the wild variety. The flowers are used by Hindus in worship.

Anonaceae

Trees or shrubs. Leaves entire, alternate. Flowers usually standing singly in the axils of leaves. Sepals 3. Petals 6, in two rows, sometimes only 3, thickish. Stamens many, closely packed. Filaments short. Connective part of anther produced into an oblong or truncate head. Ovaries several, all cohering together in a mass, each having its stigma and developing into a pulpy fruit.

- | | | |
|---|-----|-------------|
| 1 Flower-stalk bearing a hook ; flowers very fragrant | ... | Artabotrys. |
| Flower-stalk not bearing a hook ; flowers not fragrant | ... | 2 |
| 2 Ovaries united to form a compound fruit | ... | Anona. |
| Ovaries free, each borne on a stalk and becoming a separate fruit | ... | Polyalthia. |

Artabotrys, R. Br.

Climbing or straggling shrubs. Leaves shiny. Flowers arranged on recurved branches. Sepals 3. Petals 6. Ovaries few or many. Fruit a circle of berries.

Artabotrys odoratissimus, R. Br.

மஞ்ஞசிதம் మనోరంజితము

Leaves oblong-lanceolate, shortly acuminate, up to 7 in. long. Flowers standing singly or in pairs. Petals 6, yellow, $1-1\frac{1}{2}$ in. long, clothed with yellow hairs, fragrant. Ripe carpels 6-10. Flowers all through the year.

Commonly cultivated in gardens for its fragrant flowers. It is considered indigenous to South India.

Anona, Linn.

Trees or shrubs. Flowers standing singly or in clusters at the ends of branches or opposite to the leaves. Petals 3 or 6, the outer ones triangular in cross-section and having concave bases. Ovaries numerous, 1-ovuled, united together to form a many-celled, round or ovoid juicy fruit.

Members of this genus are natives of Tropical America and the West Indies but a few of them have become thoroughly naturalized in India.

- Leaves obtuse at apex, 2-3 in. long; fruit green, heart-shaped, its surface covered with rounded projections ... squamosa.
 Leaves tapering to a point at apex, 5-8 in. long; fruit yellow or red in colour, round or heart-shaped, its surface covered with lines forming a 5-cornered network ... reticulata (cultivated).

Anona squamosa, Linn. The Custard Apple

சீதாபலா Pl. I, A. శీతాఫలము

A shrub. Leaves oblong-elliptic. Flowers standing singly opposite to the leaves. Petals thick, yellowish-white, about 1 in. long. Fruit 2-4 in. in diameter, green when ripe. Seeds brownish-black, smooth. Flowers in May and June.
 This plant has run wild and is very abundant near villages.

Anona reticulata, Linn. The Bullock's Heart

இராமசீதா రఘుఫలము

A small tree. Leaves oblong-lanceolate, smooth, shiny, many-nerved, 4-7 in. long. Fruit 4-6 in. in diameter. Occasionally cultivated in gardens for its fruit.

Polyalthia, Blume

Trees or shrubs. Petals 6. Receptacle convex. Stamens wedge-shaped. Ovaries numerous. Style usually oblong. Ovules 1 or 2 in the ovary. Fruit a berry, a number of berries forming a ring.

A tree; leaves narrow, lanceolate, 7-9 in. long; flowers in clusters ... longifolia.

A shrub; leaves elliptic-oblong, 2-4 in. long; flowers standing singly on tubercles on the trunk ... Korinti.

Polyalthia longifolia, Hook.

நெட்டிலிங்கம் Pl. I, B. సరహుమిడి

A handsome evergreen tree. Leaves narrowly lanceolate, tapering to a fine point, margins wavy, shiny, 7-9 in. long. Flowers yellowish-green, about 1 in. across, arranged in clusters or umbels. Petals tapering to a point. Ripe carpels $\frac{3}{4}$ in. long, numerous, ovoid, obtuse at both ends, carried on stalks about $\frac{1}{2}$ in. long. Flowers in August and September.

Very commonly cultivated in gardens and avenues for its foliage. It is said to be a native of Ceylon. This is popularly called Ashoka though the real Ashoka of Sanscrit authors is *Saraca indica*, Linn. (See p. 104.)

Polyalthia Korinti, Hook.

A shrub. Leaves leathery, ovate to elliptic-oblong, shiny above, 2-4 in. long. Flowers greenish, standing singly on tubercles on the trunk. Fruit consisting of a number of stalked carpels, about $\frac{1}{3}$ in. in diameter. Flowers during the rains.

Vandalur Hills.

Menispermaceae

Bushy or woody climbers. Leaves simple, alternate. Flowers small, male and female on separate plants. Sepals and petals 6 each (4 in *Cissampelos*), similar. Stamens as many as the petals and opposite to them. Ovaries 3 or 1. Fruit a 1-seeded drupe, the seed often bent into a crescent or ring.

1	Sepals and petals 4 each	...	...	...	...	...	<i>Cissampelos</i> .
	Sepals and petals 6 each	...	...	...	...	...	2
2	Bases of petals having ear-like appendages	...	...	...	...	...	3
	Bases of petals not having ear-like appendages	...	...	...	...	...	4
3	Flowers in cymes or close clusters	...	...	...	...	...	<i>Cocculus</i> .
	Flowers in racemes	...	...	...	...	...	<i>Pachygone</i> .
4	Leaves deeply cordate	...	...	...	...	...	<i>Tinospora</i> .
	Leaves not deeply cordate	...	...	...	...	...	<i>Tiliacora</i> .

Cissampelos, Linn.

Leaves not attached to their stalks at the margin. Male flowers arranged in cymes. Petals united, forming a 4-lobed cup. Female flowers arranged in racemes. Sepals and petals 1 of each, adhering to bracts. Ovary 1. Style short, 3-branched.

Cissampelos Pareira, Linn.

పాట

A climber covered with soft matted hairs. Leaves nearly circular in outline, with cordate base, softly hairy when young, becoming glabrous, $1\frac{1}{2}$ -3 in. in diameter. Flowers small, greenish. Bracts in male flowers small and linear, in female flowers leaf-like. Drupe roundish, red, hairy. Flowers October to December.

Hills at Vandalur, climbing on shrubs. Occasionally found growing in hedges on the outskirts of the city.

Cocculus, DC.

Flowers in short, branching racemes in the axils of leaves. Sepals 6, the inner 3 being larger. Petals smaller than the sepals. Female flowers with 3 carpels.

Cocculs hirsutus, Diels (*Cocculus villosus*, DC.)

Young parts densely covered with soft hairs. Leaves ovate-oblong, usually truncate at base, 1-2 in. long. Male flowers yellow, in cymose panicles in the axils of leaves. Petals very thin, smaller than the sepals. Female flowers 1-3 in the axils of leaves. Petals thick and fleshy. Drupe purplish-black, of the size of a pea. Flowers in January and February.

Straggling over bushes at Pallavaram. Rather rare in the city.

Pachygone, Miers

Flowers in racemes in the axils of leaves. Male flowers with 6 stamens and 3 sterile ovaries. Female flowers with 3 ovaries and 6 sterile stamens.

Pachygone ovata, Miers

పెద్దమొరక

A large spreading shrub with long drooping or climbing branches. Leaves ovate, blunt, thick, 1-3 in. long. Flowers in racemes in the axils of leaves, minute, white, honey-scented. Drupe yellowish, about $\frac{1}{3}$ in. in diameter. Flowers in the early hot weather.

I have not collected this plant in the neighbourhood of Madras and have included it on the authority of Mr. Fischer.

Tinospora, Miers

Flowers in racemes in the axils of leaves or at the ends of branches or from the old wood. Male flowers with 6 stamens. Female flowers having 3 ovaries and 6 undeveloped stamens.

Tinospora cordifolia, Miers

కోర్డీఫోలిం Pl. I, C. తిప్పక

An extensive glabrous climber. Bark papery at first, then corky. Leaves roundish to ovate, deeply cordate, thin, glabrous, 2-3½ in. long. Flowers yellow, often clustered on old wood. Drupe red, of the size of a large pea. Flowers November to March.

More common than the other members of this family. Adyar, in thickets. Guindy Park, climbing on trees. In hedges at Teynampet. Used in medicine.

Tiliacora, Colebr.

Leaves ovate. Flowers in elongate panicles. Male and female flowers often on the same plant. Male flowers with 6 stamens and 3 sterile ovaries. Female flowers with 3-12 ovaries.

Tiliacora acuminata, Miers (*Tiliacora racemosa*, Colebr.)

A large climbing shrub. Leaves ovate, tapering at the end, rounded at the base, shiny, 2-4 in. long. Flowers yellow, $\frac{1}{4}$ in. across, arranged in branched racemes in the axils of leaves. Racemes over 6 in. long. Drupes red, oblong, about $\frac{1}{2}$ in. long, carried on short stalks. Flowers in September.

Pallavaram, climbing over bushes. Not a common plant.

Nymphaeaceae

Perennial water-plants. Leaves and flowers floating on the surface of water or standing above it, the latter large and standing singly. Sepals 3-5. Petals and stamens many. Ovary of many cells or of several independent carpels.

Leaves floating; ovary composed of many cells	...	...	Nymphaea.
Leaves raised above the water; carpels distinct, sunk in	...	...	Nelumbium.
a fleshy central axis	...	...

Nymphaea, Linn.

Leaves attached to their stalks by their lower surface. Sepals 4. Petals gradually passing into stamens. Filaments of stamens petal-like. Ovary crowned by radiating stigmas. Fruit a many-celled, many-seeded berry.

Margins of leaves entire or wavy; surfaces of leaves glabrous;
flowers usually blue (sometimes white, rose or purple) ... stellata.

Margins of leaves wavy and toothed; leaves softly hairy on the
under surface; flowers never blue, but white or red ... pubescens.

Nymphaea stellata, Willd.

கருநெய்தல், நீலோற்பலம்

ఇండికరము

Leaves roundish, glabrous on both surfaces, cleft at base, blotched with purple beneath, up to 6 in. in diameter. Flowers pale blue in the form met with in Madras, 3-4 in. in diameter, having a mild fragrance, open all day. Fruit globular. Flowers December to March.

Abundant in the pools close to the Red Hills Tank.

Nymphaea pubescens, Willd. (*Nymphaea lotus*, Linn., var. *pubescens*, Hook.)

The Water Lily

அல்லி

Pl. II, A.

ఇండికరము

Leaves round, softly hairy on the under surface, cleft at the base, 6-10 in. in diameter. Flowers red, white or pale rose, opening in the morning, larger than in the preceding species. Flowers in the rainy and cold weather.

Cultivated in tanks in gardens. In company with the last species it grows in pools near the Red Hills Tank.

Nelumbium, Juss.

Leaves attached to their stalks by the middle of their lower surface. Connective part of anther prolonged above the anthers. Style very short. Ovaries many, 1-celled, sunk in the flat top of a fleshy axis which is shaped like an inverted cone.

Nelumbium speciosum, Willd. The Lotus

தாமரை

तामस

Leaves round, upper surface concave, covered with a whitish bloom, 1-2 ft. in diameter. Stalk 3-6 ft. long. Flowers white or pink, 6-10 in. in diameter. The fleshy axis containing the ovaries $\frac{3}{4}$ in. long, the top flat, 1 in. broad, becoming enlarged in fruit to a breadth of 2-4 in. Flowers after the rains.

In many ponds and tanks in the city. The flower is used in worship and is considered sacred. The under-ground stems are eaten. The fruit is used in medicine.

Papaveraceae

Erect herbs with milky or coloured juice. Leaves alternate. Flowers standing singly at the ends of branches. Sepals 2 or 3, falling off rather early. Petals 4 or 6. Stamens numerous. Ovary 1-celled, with numerous ovules attached to the walls. Fruit a pod opening by valves or pores at the top.

Argemone, Linn.

Stem, leaves and pods covered with prickles. Juice yellow. Flowers yellow.

Argemone mexicana, Linn. The Mexican Poppy

பிரமதண்டு

Pl. II, B.

అశుభం

Stem with a bluish-grey bloom. Leaves with a white blotch along the main nerves, not stalked, clasping the stem, margin produced at intervals into long spines, 3-6 in. long. Flowers 1-2 in. across. Sepals 3, bases prickly. Petals 6, bright yellow. Style almost none. Stigmas 4-7. Cells in ovary 4-7, splitting at the top when ripe.

A very common weed of road sides and waste places. To be met with in flower all through the year. A native of America now thoroughly naturalized in India. The yellow juice is used in medicine.

Cruciferae

Herbs with watery juice. Leaves alternate or all arising from the crown of the root. Flowers in racemes. Sepals and petals 4 each, imbricate in bud. Stamens 6, the 4 inner ones longer than the 2 outer. Ovary divided into 2 chambers by a thin partition, or single-chambered. Ovules arranged in 2 series on the walls where they meet the

Gynandropsis, DC.

Annual herbs. Leaves palmately compound. Flowers in racemes. Petals stalked, open in bud. Stamens 6, inserted on the stalk bearing the ovary. Capsule elongate.

Gynandropsis pentaphylla, DC.

வேளை

பாய்லா

A short-lived annual. Leaflets 3-5, obovate, wedge-shaped at base, $\frac{3}{4}$ -1½ in. long. Petals pale pink, $\frac{5}{8}$ in. long. Stamens purple. Capsule 2-3½ in. long, tapering at both ends. Flowers in the rainy and cold weather.

Very common in waste places.

Cleome, Linn.

Herbs. Leaves palmately compound, having 3-9 leaflets or occasionally simple. Flowers in racemes or standing singly in the axils of leaves. Stamens 6 or more. Capsule elongate.

- | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-------------|
| 1 | Leaves simple | ... | ... | ... | ... | ... | monophylla. |
| | Leaves compound | ... | ... | ... | ... | ... | 2 |
| 2 | Whole plant covered with sticky hairs | ... | ... | ... | ... | ... | viscosa. |
| | Sticky hairs not present | ... | ... | ... | ... | ... | 3 |
| 3 | Stem and leaves covered with small prickles | ... | ... | ... | ... | ... | aspera. |
| | Stem and leaves not covered with prickles | ... | ... | ... | ... | ... | 4 |
| 4 | Leaflets 3, linear, thread-like | ... | ... | ... | ... | ... | tenella. |
| | Leaflets 5-9, obovate | ... | ... | ... | ... | ... | Chelidonii. |

Cleome monophylla, Linn.

An erect branched annual. Leaves simple, passing gradually into bracts above, yellowish in bud, linear-oblong, 1-3 in. long. Flowers pink, in the axils of leaf-like bracts, in long erect racemes. Bracts ovate. Stamens 6 or 7. Capsule cylindrical, pointed, covered with hairs, 2½-3½ in. long. Flowers October to December.

A weed of cultivated ground.

Cleome viscosa, Linn.

நாயக்கடுகு, நாயவேளை

Pl. II, D.

கந்த-பாய்லா

An erect annual densely clothed with sticky hairs. Leaflets 3 or 5, obovate, up to 1¾ in. long. Flowers in racemes. Petals yellow. Stamens exceeding 12. Capsule tapering at both ends, hairy, 2-2½ in. long. Flowers chiefly in the rainy and cold seasons.

One of the commonest weeds of waste places, cultivated ground, railway lines, etc.

Cleome aspera, Koenig

An annual herb beset with small prickles. Leaflets 3, oblanceolate, up to 1 in. long, the middle leaflet much larger than the lateral ones. Flowers standing singly in the axils of leaves, small, yellow. Stamens 6. Capsule about 1 in. long. Flowers in the rainy months.

In sandy places near the sea. Also on waste land near Chetpat.

Cleome tenella, Linn.

A slender annual branching from the base. Leaflets 3, slender, thread-like, up to 1 in. long. Flowers yellow, in few-flowered racemes. Stamens 6. Capsule about 1 in. long. Flowers September to November.

In sandy places near the sea.

Cleome Chelidonii, Linn.

An erect annual. Leaflets 5-9, oblanceolate-obovate, hairy, up to $2\frac{1}{2}$ in. long. Leaf-stalks up to 4 in. long. Flowers in racemes. Petals rose-red. Stamens many. Anthers yellow. Capsule 2-4 in. long, tapering at both ends. Flowers in December and January.

In moist places, particularly in paddy fields soon after the harvest is gathered.

Crataeva, Linn.

Trees. Leaflets 3. Petals stalked, open in both flower and bud. Stamens numerous, inserted at the base of the stalk bearing the ovary. Fruit a berry.

Crataeva religiosa, Forst.

மாவிலிங்கம்

செல் டீரமி

A moderate-sized tree. Leaflets obovate, glabrous, 2-6 in. long. Flowers arranged in corymbs in the axils of leaves or at the ends of branches. Petals yellowish-white. Stamens purple. Fruit about 2 in. in diameter. The flowers appear in April when the tree stands bare of leaves. The young leaves appear in May.

Occasionally planted and sometimes self-sown.

Cadaba, Forsk.

Shrubs. Leaves simple or palmately compound. Petals stalked. Fruit a berry, sometimes breaking open ultimately. In the centre of the flower is a funnel-shaped or spoon-shaped structure (gland) carried on a short stalk.

Cadaba indica, Lamk.

விழுது

A rambling shrub. Leaves elliptic-oblong, glabrous, $\frac{3}{4}$ - $1\frac{1}{2}$ in. long. Flowers in few-flowered racemes at ends of branches. Stamens 4, greenish-white. Fruit like a blunt chili, red. Flowers January to October.

Hills at Pallavaram. Near Mylapore, in hedges.

Maerua, Forsk.

Climbing shrubs devoid of thorns. Leaves simple. Flowers in corymbs. Petals 4, smaller than the calyx-lobes. Stamens many. Berry fleshy, elongate.

Maerua arenaria, Hook.

పూతీక

A woody climber. Leaves elliptic-oblong, 1-3 in. long. Flowers numerous, greenish. Fruit pale-brown, elongated, twisted and knotted. Flowers December to March.

Hills at Vandalur.

Capparis, Linn.

Erect or climbing shrubs, often armed with thorns. Leaves simple. Flowers often showy. Petals not stalked. Stamens many. Fruit a berry.

- | | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-----|-------------|
| 1 | An erect shrub | ... | ... | ... | ... | ... | ... | brevispina. |
| | Climbing shrubs | ... | ... | ... | ... | ... | ... | 2 |
| 2 | Flowers in umbels | ... | ... | ... | ... | ... | ... | sepiaria. |
| | Flowers standing vertically above the axils of leaves | ... | ... | ... | ... | ... | ... | zeylanica. |

Capparis brevispina, DC. (*Capparis zeylanica*, Wall.)

A large thorny shrub. Leaves broadly lanceolate or elliptic, tough, $1\frac{1}{2}$ - $2\frac{1}{2}$ in. long. Flowers fairly large, standing singly in the axils of leaves. Petals white, marked with a large brown spot at the base which becomes red on fading. Fruit ovoid, 2 in. in diameter. Flowers January to April.

Hills at Pallavaram and Vandalur.

Capparis sepiaria, Linn.

నల్లయిప్పి

A straggling thorny shrub. Leaves oblong, glabrous, shiny, $\frac{3}{4}$ - $1\frac{1}{2}$ in. long. Flowers in umbels, small. Petals greenish-white. Fruit black, about $\frac{1}{4}$ in. in diameter. Flowers May to December.

In hedges at Nungambakam and in jungly places near Adyar.

Capparis zeylanica, Linn. (*Capparis horrida*, Linn.)

అతణ్ణి

Pl. II, E.

ఆరుకొండ

A very thorny woody climber. Younger parts downy with short brown hairs. Stipules modified into stout recurved thorns. Leaves elliptic-oblong, glabrous, shiny above, 1-3 in. long. Flowers white, turning purple. Filaments purple. Fruit reddish-brown, $1\frac{1}{2}$ in. in diameter. Flowers March to July.

Common in hedges and thickets. The leaves are used medicinally.

Violaceae

Usually herbs, rarely shrubs or trees. Leaves alternate, having stipules. Sepals 5. Petals 5, almost always unequal. Stamens 5. Ovary 1-celled, with numerous ovules attached to the walls along three lines. Fruit breaking open along the same 3 lines.

Ionidium, Vent.

Herbs (or small shrubs). Flowers standing singly in the axils of leaves. Sepals more or less equal. The lowest petal very much larger than the others and with a slender process prolonged backwards into a curved sac or spur.

Ionidium suffruticosum, Ging.

சூரியகாந்தி Pl. III, A. நூர்யகாந்தி

A low perennial herb. Leaves lanceolate, 1-2 in. long, with very short stalks. Petals red, the lowest one fan-shaped, very much larger than the others and with a short rounded spur arising from the base. Capsule roundish, about $\frac{1}{4}$ in. in diameter, with few seeds. Flowers at all seasons except the driest.

Very common in fields and waste places.

Bixaceae

Trees or shrubs. Leaves alternate. Flowers having stamens or ovary only, or both. Sepals 3-8. Petals 4 or 5, sometimes absent, soon falling. Stamens many. Ovary 1- to many-celled. Ovules attached to the walls of the ovary.

Flacourtia, Commers.

Trees or shrubs, often thorny. Leaves toothed or crenate, 3- to 5-nerved at the base. Flowers small, the male and female on separate plants. Sepals 4 or 5, imbricate. Petals absent. Stamens numerous. Ovary on a glandular disk, 2- to 5-celled. Styles 2 or more. Fruit not splitting.

Flacourtia sepiaria, Roxb.

சொத்தைக்களா தாழிசுழி

A thorny shrub. Leaves elliptic or obovate, crenate, stiff, glabrous, $\frac{1}{2}$ -1 in. long. Flowers standing singly or few together in the axils of leaves or on the thorns, very small, greenish. Stigmas 3 or 4, on very short styles. Fruit rounded, small, $\frac{1}{3}$ in. in diameter. Flowers August to January.

In scrub jungle at Avadi and Vandalur Hills.

Bixa orellana, Linn.

జాపరామరమ్ జాపరాచెట్టు

A small evergreen tree. Leaves large, cordate, acuminate, 4-8 in. long. Flowers white or pink, in terminal panicles, about 2 in. in diameter. Capsules ovoid, softly bristly, reddish-brown. A native of South America and the West Indies occasionally cultivated in gardens. The pulp which surrounds the seeds, known in commerce as "Annatto", is used as a dye for colouring cheese, butter and chocolate.

Polygalaceae

Herbs (shrubs or trees). Leaves alternate. Sepals 5, the two inner ones larger than the three outer ones, the former often coloured like the petals. Petals 3, the lowest one longer than the other two and boat-shaped. Stamens 8, united into a sheath. Anthers opening by pores at the top. Fruit a 2-celled, 2-seeded pod.

Polygala, Linn.

Herbs (or shrubs). Flowers in small racemes. The lowest petal tipped with a fringed crest. Stamens united with the petals at their bases. Fruit a flattened pod.

Flowers yellow, not standing erect but hanging or facing
sideways chinensis.

Flowers green, standing erect on their stalks and facing
upwards rosmarinifolia.

Polygala chinensis, Linn.

Pl. III, B.

An erect or loosely spreading herb. Leaves on short stalks, narrowly oblong, $\frac{1}{2}$ - $1\frac{1}{2}$ in. long. Flowers in racemes under 1 in. long. Inner sepals greenish. Petals yellow, pink when unopened. Crest of lowest petal red. Capsule flattened, circular-oblong in outline, with a shallow depression at the apex, hairy along the edge. Flowers July to February.

A common weed on lawns. At the Red Hills Tank in areas not covered with water there were found in November, 1924, perfectly white-flowered specimens growing side by side with the common yellow-flowered plants.

Polygala rosmarinifolia, Wt. & Arn.

A spreading annual herb. Stems many, arising from the root. Leaves very narrowly oblong, narrowed at the base, minutely hairy along the edges, $\frac{3}{4}$ - $1\frac{1}{2}$ in. long. Flowers fewer and smaller than in the last species. Corolla green. Capsule hairy on the margins as well as on the surface. Flowers in December and January.

Collected only at Adyar. In Gamble's Flora of the Presidency of Madras the localities recorded for this species are the hills of Vizagapatam, the Western Ghats and the hills of Salem. It is interesting to notice this species growing in Madras.

Caryophyllaceae

Herbs. Leaves opposite, entire. Stipules scale-like or absent. Sepals 4 or 5, sometimes united into a toothed calyx. Petals 4-5. Stamens 8 or 10. Ovary 1-celled. Ovules 2 or many, attached to a central column inside the ovary. Fruit usually a capsule.

Polycarpaea, Linn.

Leaves linear. Stipules scale-like. Flowers numerous. Sepals 5, scale-like, sometimes coloured. Petals 5. Stamens 5. Ovary 1-celled. Style slender, 3-toothed. Ovules numerous. Capsule breaking open along three lines.

Polycarpaea corymbosa, Lamk.

Pl. III, C.

A slender erect herb. Leaves narrow, linear, with a sharp point at apex, about $\frac{1}{2}$ in. long. Stipules lanceolate, with fringed apex. Flowers numerous, small, in dense much-branched cymes forming flat-topped heads at ends of branches. Bracts silvery-white, bristle-pointed. Sepals scale-like, white. Petals less than half the length of the sepals. Capsule very small, shiny, brown. Flowers at all seasons but the driest.

Adyar, on the sands. Pallavaram, on the way to the hills. Ennur, on the sands.

Portulacaceae

Fleshy herbs. Leaves fleshy. Flowers one or more at the ends of branches. Sepals 2, adherent to the ovary at the base. Petals 4 or 5, fading and falling away quickly. Stamens 4 to many. Ovary partially adherent to the sepals, with few or many ovules.

Portulaca, Linn. Purslane

Flowers standing singly or in clusters, surrounded by a whorl of leaves. Lower half of ovary adhering to the sepals, the upper half free. Seeds many. Capsules opening transversely, the upper portion coming off as a lid.

1	Nodes without hairs	...	...	...	...	...	oleracea.
	Nodes with few or abundant hairs	...	...	...	...	2	
2	Roots not thickened	...	...	...	...	...	quadrifida.
	Roots thickened	...	...	...	...	3	
3	Flowers yellow	...	...	...	...	...	tuberosa.
	Flowers purplish or rose-red	...	...	...	...	...	pilosa.

Portulaca oleracea, Linn.

പഴുതേൻ Pl. I, D. పప్పుకూర, పెద్దపావలికూర

A succulent prostrate annual herb. Stem slightly reddish. Leaves almost opposite, obovate to wedge-shaped, margins reddish, $\frac{1}{4}$ -1 in. long. Petals 5, pale yellow. Stamens 8-12. Flowers July to March.

Common on cultivated and waste ground. The leaves are eaten as a vegetable.

Portulaca quadrifida, Linn.

శిల్పిపశుతేనె సన్నపప్పుకూర, చిన్నపావలికూర

A small slender spreading annual. Stems reddish, thread-like, rooting at the nodes. Leaves opposite, ovate, $\frac{1}{4}$ in. long. Petals 4, yellow. Stamens 8. Style cleft into 4. Flowers June to February. The flowers open about noon.

A very common weed in gardens. Eaten as a vegetable.

Portulaca tuberosa, Roxb.

బొడ్డికూర

Stems many, arising from the top of a thickened spindle-shaped root. Nodal hairs plentiful and conspicuous. Leaves linear, fleshy, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Flowers few together, surrounded by a ring of brownish hairs and a whorl of 6-8 leaves. Petals 5, yellow. Stamens numerous. Style slender, cleft into 5. Flowers November to January.

On the sands near the sea.

Portulaca pilosa, Linn.

Stems arising from the top of a thickened root which tapers towards its lower end. Nodes covered with hairs. Leaves fleshy, linear, about $\frac{1}{2}$ in. long. Flowers standing singly at the ends of branches and surrounded by a tuft of hairs and a whorl of 5 or 6 leaves. Petals 5, pink. Stamens numerous. Flowers July to January.

A native of Tropical America, introduced probably along with cultivated plants. Mambalam Tank. Spur Tank. Museum compound (1923). The Island.

Elatinaceae

Small aquatic or terrestrial herbs. Leaves opposite or whorled, having stipules. Flowers small. Sepals and petals 2-5 each, their edges overlapping. Stamens as many or twice as many as the petals. Ovary 2- to 5-celled. Styles 2-5. Ovules numerous. Fruit a capsule.

Leaves entire; sepals 3; small prostrate herbs; flowers standing singly in the axils of leaves Elatine.

Leaves serrate or crenate; sepals 5; stout erect herbs; flowers densely clustered Bergia.

Elatine, Linn.

Leaves opposite or whorled. Flowers minute, usually one at each node. Sepals 2-4, obtuse. Petals 2-4. Ovary globose. Capsule thin.

Elatine ambigua, Wt.

Leaves opposite, oblong-lanceolate, up to $\frac{1}{3}$ in. long. Stipules scale-like. Sepals, petals and stamens 3 each. Flowers November to February. In patches on mud.

Bergia, Linn.

Leaves opposite, serrate. Flowers clustered in the axils of leaves. Sepals with acute apex. Capsule 3- to 5-celled.

Fleshy-stemmed water-plant; flowers crowded capensis.

Stiff erect land-plant; flowers 1-4 together aestivosa.

Bergia capensis, Linn. (*Bergia verticillata*, Willd.)

Pl. III, D.

A glabrous succulent herb $\frac{1}{2}$ -1 ft. high. Stems pink, branched, rooting from the lower joints. Leaves elliptic-lanceolate, narrowed at each end, serrate, glabrous, 1-1 $\frac{1}{2}$ in. long. Sepals 5, lanceolate. Petals 5, ovate-oblong. Stamens 10. Capsule globose. Flowers in October and November.

On the borders of a pond near Nungambakam.

Bergia aestivosa, Wt. & Arn.

A slender branching herb. Leaves narrow, obovate or oblong, serrate, $\frac{1}{3}$ - $\frac{3}{4}$ in. long. Flowers arranged in the axils of leaves. Petals pink. Stamens 10.

I have not collected this plant. Gamble has recorded this species for Madras.

Guttiferae.

Trees with a yellowish or greenish juice. Leaves simple, opposite. Flowers unisexual or bisexual. Sepals and petals 4-12. Stamens many. Ovary with 1 or more cells.

Calophyllum, Linn.

Leaves leathery in texture; nerves very numerous running parallel to each other at right angles to the midrib. Sepals and petals 4 each. Ovary 1-celled with 1 ovule. Fruit fleshy, with a hard shell enclosing the seed.

Calophyllum inophyllum, Linn. The Alexandrian Laurel

புன்னை Pl. III, E. பூச்சு

Leaves shiny on both sides, elliptic-oblong, entire, 4-7 in. long. Flowers on a branched axis, carried on white stalks, sweet-scented, nearly 1 in. across. The 2 inner sepals and petals white. Anthers yellow. Ovary red. Fruit roundish, green, a little more than an inch in diameter. Flowers in December and January. A second flowering usually occurs in May and June.

A native of the East and the West Coasts commonly grown in gardens as an ornamental tree and often found wild near Madras. The seeds yield a lamp-oil.

Malvaceae

Herbs, shrubs or trees. Leaves alternate, having stipules. An involucre of bracts often present below the calyx having the appearance of an additional calyx. Calyx of 5 sepals united at base. Corolla of 5 petals overlapping each other in bud. Stamens numerous, disposed on a column that surrounds the pistil. Anthers 1-celled. Ovary 3- to many-celled or of 3- many independent carpels closely united in a ring around a central axis. Ovules 1 or more in each cell. Fruit a capsule either breaking open between the partition walls or separating into distinct carpels after ripening.

- | | |
|---|--------------------|
| 1 Herbs or shrubs (<i>Hibiscus tiliaceus</i> is a small tree) | 2 |
| Large trees | 9 |
| 2 Carpels separating from the axis after ripening | 3 |
| Carpels united; fruit a capsule splitting between the partition walls | 8 |
| 3 Styles as many as the carpels; anthers at the top of the staminal column | 4 |
| Styles twice as many as the carpels; anthers on the sides of the staminal column | 6 |
| 4 Bracteoles 3 | Malvastrum, p. 36. |
| Bracteoles absent | 5 |
| 5 Ripe carpels breaking open irregularly; fruit not flat-topped; flowers opening before midday | Sida, p. 36. |
| Ripe carpels breaking open along a regular central line; fruit flat-topped; flowers opening towards evening... .. | Abutilon, p. 39. |
| 6 Flowers in dense heads, 4-6 together in each involucre | Malachra, p. 39. |
| Flowers not in heads | 7 |
| 7 Leaves with a large gland at the base of the midrib on the under side; bracts of involucre triangular-lanceolate; ripe carpels beset with spines | Urena, p. 40. |
| Leaves without glands; bracts of involucre linear or ovate; carpels not beset with spines | Pavonia, p. 41. |

- 8 Bracteoles not large, neither toothed nor fringed with thread-like processes Hibiscus, p. 42.
- Bracteoles large and leaf-like, toothed or fringed with thread-like processes Gossypium (cultivated), p. 45.
- 9 Evergreen trees; leaves simple Thespesia, p. 46.
- Deciduous trees; leaves palmately compound IO
- 10 Trunk short and stout, without thorns; flower-stalks 6-8 in. long, hanging; calyx with 5 teeth; stamens grouped in one bundle Adansonia (cultivated), p. 46.
- Trunk tall, armed with thorns at least in the young stages; flower-stalks under 2 in. long, not hanging; calyx not toothed, truncate; stamens in 5 bundles ... II
- 11 Flowers over 3 in. long; capsules thick, woody; bark soon becoming grey Bombax, p. 47.
- Flowers 1-1½ in. long; capsules thin, leathery; bark remaining green for a long time Eriodendron (cultivated), p. 47.

Malvastrum, A. Gray

Herbs. Flowers in the axils of leaves or in leafy spikes at the ends of branches. Bracts of involucre 3, narrow. Ovary with 5 or more carpels. Styles as many as the carpels. Stigma forming a distinct head on the top of the style. Fruit separating into 1-seeded parts on ripening.

Malvastrum coromandelianum, Garcke (*Malvastrum tricuspidatum*, A. Gray)
Pl. IV, A.

A small erect branched herb. Stem, branches and leaves covered with hairs that lie flat and are attached to the stem throughout their whole lengths. Leaves ovate-lanceolate, irregularly-toothed, 1-1½ in. long. Flowers at the ends of leafy branches, opening towards evening. Corolla pale-yellow, longer than the calyx. Carpels 8-12. Appearing after the early rains and continuing till the hottest months.

A garden weed. Museum compound.

Sida, Linn.

Herbs or shrubby herbs, softly hairy. Leaves toothed. Flower-stalks jointed. Bracteoles absent. Flowers rather small. Ovary of 5-12 carpels arranged round a central axis. Ovules 1 in each carpel. Styles as many as the carpels. Fruit enclosed by the calyx and separating into as many 1-seeded parts as there are carpels.

- | | | |
|---|---|-----------------|
| 1 | Whole plant velvety; awns of carpels standing above the calyx-segments and covered with backward-pointing hairs; ovary 10-celled | cordifolia. |
| | Plant softly hairy, not velvety; awns of carpels shorter than the calyx-segments | 2 |
| 2 | Ovary and fruit 5-celled | 3 |
| | Ovary and fruit 6- to 10-celled | 4 |
| 3 | Leaves acute at apex; flower-stalks jointed at the middle ... | veronicaefolia. |
| | Leaves obtuse at apex; flower-stalks jointed near the flower | spinosa. |
| 4 | Leaves entire, small, wedge-shaped at apex | Schimperia. |
| | Leaves serrate, over 1 in. long | 5 |
| 5 | Leaves glabrous; flower-stalk equal to the leaf-stalk in length | acuta. |
| | Leaves covered with soft whitish hairs; flower-stalk longer than leaf-stalk | 6 |
| 6 | Flower-stalk jointed a little above the middle | rhombifolia. |
| | Flower-stalk jointed at the base | rhomboidea. |

Sida cordifolia, Linn.

తెల్ల ఆంధ్ర

A short erect herb. Leaves ovate-oblong, cordate at base, obtuse at apex, crenate, velvety on both surfaces, 1-2 in. long. Petioles $\frac{1}{2}$ -1 in. long. Flower-stalks up to $\frac{3}{4}$ in. long, jointed above the middle. Flowers standing singly or few together. Calyx with ovate acute lobes, $\frac{1}{4}$ - $\frac{1}{3}$ in. long. Corolla yellow, slightly longer than the calyx. Carpels of ovary 10. Fruit with a pair of awns for each carpel and nearly as long as the latter. Flowers in December and January.

On waste lands.

Sida veronicaefolia, Lamk. (*Sida humilis*, Willd.)

A more or less hairy herb with trailing branches. Leaves ovate, cordate, acute or slightly acuminate, serrate, sparsely hairy, 1-2 in. long. Flowers 1-2 in the axils of leaves. Flower-stalks $\frac{1}{2}$ -1 $\frac{1}{2}$ in. long, jointed above the middle. Calyx $\frac{1}{6}$ in. long, hairy. Corolla pale yellow. Carpels 5, each with 2 short awns. Flowers August to November.

Very common in all waste places.

Sida spinosa, Linn.

నాగబల

An erect branched herb. Leaves oblong-elliptic, obtuse, crenate, scattered silvery hairs present in addition to soft matting of hairs on both surfaces, undersurface greyish, up to 2 in. long. Petioles up to 1 in. long. Flowers 1 or few together in the axils of leaves.

Flower-stalks up to $\frac{3}{4}$ in. long, jointed below the calyx. Calyx grey, hairy. Corolla pale yellow. Carpels 3. Awns 2 on each carpel, short. Flowers in October and November.

In waste places. Nungambakam. Kilpauk.

The specific name of this plant is rather misleading as one is apt to look for well-developed spines. There are two short but stiff projections on the branches at the base of the leaves which however cannot be called spines.

Sida Schimperiana, Hochst.

Pl. IV, C.

A woody, rather prostrate, profusely branching herb arising from a perennial underground stock. Leaves wedge-shaped at base, 2-lobed at apex with a sharp point in the angle between the lobes, entire under surface densely hairy, $\frac{1}{2}$ in. long. Flowers 1 in each axil, on quite short stalks. Calyx covered densely with grey hairs. Corolla pink. Carpels 5. Awns 2 on each carpel, short, converging. Flowers August to February.

In dry open situations.

Sida acuta, Burm. (*Sida carpinifolia*, Linn.)

பழம்பாசி

An erect shrubby herb. Leaves lanceolate, serrate, acute, practically glabrous, 2-3 in. long. Petiole $\frac{1}{4}$ in. long, shorter than the stipules. Flowers 1 or 2 in the axils of leaves, on stalks shorter than the petiole and jointed at the middle. Calyx practically glabrous, $\frac{1}{4}$ in. long. Corolla yellow, nearly twice as long as the calyx. Carpels 6-9, each with 2 awns. Flowers October to December.

In jungly places.

Sida rhombifolia, Linn.

சிற்றமுட்டி

Pl. IV, D.

మత్త వపులను

An erect shrubby herb. Branches woody. Leaves more or less tapering or wedge-shaped at the base, broadened at the top, margin of the upper part toothed, under-surface silvery with fine hairs, about 1 in. long. Petioles 1-6 in. long. Stipules longer than the petioles. Flower-stalks at least twice as long as the petiole, up to $\frac{3}{4}$ in. long, jointed above the middle. Calyx minutely hairy. Corolla yellow. Carpels 6 or more, 2-awned. Flowers October to December.

In waste places, cultivated ground, etc., Guindy Park. Museum compound. The roots are used in Indian medicine.

Sida rhomboidea, Roxb. (*Sida rhombifolia*, Linn., var. *rhomboidea*, Masters)

அரிவாள்மனைப்பூண்டு

A perennial shrubby herb. Leaves ovate-elliptic, serrate, narrowing towards the base, practically glabrous, excepting for a few scattered hairs on the upper surface, up to $2\frac{1}{2}$ in. long. Petioles $\frac{1}{8}$ in. long. Stipules longer than the petiole. Flower-stalks shorter than

in *Sida rhombifolia*, jointed near the base, up to $\frac{1}{3}$ in. long. Calyx minutely hairy. Petals yellow, with a deep notch at apex, opening at about noon. Carpels 10, shortly awned. Flowers October to March and often continuing in sheltered places in the hot weather.

In waste places. Museum compound.

Abutilon, Gaertn.

Herbs or shrubs. Leaves cordate at base, long-stalked, toothed. Flowers usually single in the axils of leaves. Flower-stalks jointed near the top. Petals imbricate in bud. Carpels 5 to many. Styles as many as the carpels. Ripe carpels ultimately separating from the short central axis. Carpels 1- to 5-seeded, breaking open. Seeds kidney-shaped.

Corolla 1 in. across; carpels with a pointed beak *hirtum*.

Corolla $\frac{1}{2}$ in. across; carpels obtuse *crispum*.

Abutilon hirtum, G. Don. (*Abutilon graveolens*, Wt. & Arn., var. *hirtum*, Masters)

தூத்தி Pl. IV, B.

A shrubby herb often attaining 5 ft. in height. Stem clothed with stiff hairs in addition to a covering of shorter hairs. Leaves deeply cordate at base, nearly circular in outline, abruptly acuminate, 2-5 in. in diameter. Petiole 3-6 in. long. Flower-stalks nearly as long as the petiole and jointed near the flower. Petals orange-yellow, 1 in. across. Carpels about 20, shortly beaked. Seeds covered with minute soft hairs. Flowers October to December, flowers opening in the evening.

Common in waste places.

Abutilon crispum, G. Don.

சிறு தூத்தி

A weak annual herb. Leaves ovate, cordate, acuminate, crenate, silvery on the under surface, $2\frac{1}{2}$ -3 in. long. Pedicels about $1\frac{1}{2}$ in. long. Flowers 1 or 2 in the axils of leaves, in the latter case the flower-stalks of different lengths. Flower-stalks slender, jointed above the middle, bent down in fruit, about $1\frac{1}{4}$ in. long. Calyx $\frac{1}{4}$ in. long. Corolla yellow, $\frac{1}{2}$ in. across. Fruit bladder-like, wrinkled, $\frac{1}{2}$ in. in diameter. Carpels 10-20, obtuse, sparsely hairy. Seeds with scattered glistening hairs. Flowers in December.

Mylapore. Adyar.

Malachra, Linn.

Erect annual herbs clothed with stiff bristly hairs. Leaves simple, palmate, apices rounded or pointed. Bracts of involucre 4, leaf-like. Ovary 5-celled; cells with one ovule. Styles 10. Ripe carpels separating from the axis, not splitting open.

Malachra capitata, Linn.

A coarsely hairy annual. Leaves circular-ovate, cordate, three-pointed, crenate, 2-3 in. long. Leaf-stalks jointed near the blade, $1\frac{1}{2}$ -2 in. long. Flowers 3, 4 or more in the axil of each leaf, on stalks varying in lengths from $\frac{1}{2}$ -3 in. and all starting from the same point. Bracts of involucre 4 for each flower, 3 of which are equal, the fourth smaller and attached higher up than the others. Flowers yellow, 4-6 in each involucre. Carpels 5, rounded on the back, wedge-shaped on the inner side. Seeds smooth. Flowers December to March.

A common weed in rice fields near Nungambakam. The stem yields a fibre of good quality. It is a native of tropical America and was introduced as a fibre plant into India where it has become completely naturalized.

Urena, Linn.

Shrubby herbs covered with minute rough hairs. Leaves simple, palmate, apices rounded or pointed. Bracts of involucre 5. Ovary 5-celled; cells 1-ovuled. Branches of the style 10. Fruit covered with spines, the carpels separating from the axis but not breaking open.

Leaves slightly lobed	...	...	...	...	...	...	lobata.
Leaves deeply lobed; lobes narrowed at their bases	...	...	...	...	...	...	sinuata.

Urena lobata, Linn.

A shrubby herb 2-4 ft. high. Leaves broader than long, cordate, serrate, 5- to 7-pointed, hairy on both surfaces, $4\frac{1}{2}$ in. long. Lobes acute or acuminate, less than half the length of leaf. A gland often present on the under side of the base of the midrib. Flowers clustered in the axils, on much-reduced stalks. Bracts of involucre nearly as long as the calyx, covered with rigid hairs. Corolla pink, $\frac{5}{8}$ in. long. Capsule softly hairy, covered with blunt spines. Seeds smooth. Flowers after the rains.

In waste places. The stem yields a fibre.

Urena sinuata, Linn.

A shrubby herb 4 ft. high. Leaves pinnately divided into 5 deep lobes, 3-nerved at the base, hairy on both surfaces, up to 3 in. long. Lobes narrowed at the base, obtuse at apex, serrate. A gland present near the base of the midrib on the under side. Flowers clustered in the axils, on much-reduced stalks. Petioles $1\frac{1}{2}$ in. long. Corolla rose-coloured, $\frac{3}{4}$ -1 in. across. Capsule spiny. Flowers October to December.

In waste places. The stem yields a fibre.

Pavonia, Cav.

Herbs or shrubby herbs. Leaves simple, palmate, apices rounded or pointed. Flowers in the axils of leaves or clustered at the ends of branches. Bracts of involucre 5 to many, free. Ovary 5-celled; cells with one ovule. Styles 10. Ripe carpels separating from the axis, breaking open or not.

- | | | | | | |
|---|--|-----|-----|-----|-------------|
| 1 | Bracts of involucre 5; flowers yellow | ... | ... | ... | procumbens. |
| | Bracts of involucre 8-12; flowers pink or white | ... | ... | ... | 2 |
| 2 | Leaves deeply lobed; carpels 3-angled, glabrous | ... | ... | ... | zeylanica. |
| | Leaves not deeply lobed; carpels rounded at the back, softly hairy | ... | ... | ... | odorata. |

Pavonia procumbens, Boiss. (*Pavonia glechomifolia*, Garcke)

A spreading herb. Leaves ovate, cordate, usually 3-lobed, coarsely crenate-serrate, minutely hairy on both surfaces, $1\frac{1}{2}$ -2 in. long. Petioles 1-2 in. long. Flowers standing singly in the axils of leaves on stalks $1-1\frac{1}{2}$ in. long and jointed near the flower. Bracts of involucre longer than the calyx. Calyx densely downy. Corolla yellow, $\frac{3}{4}$ in. across. Carpels rough, due to hard protuberances. Flowers in December.

Ennur, in the scrub jungle on the north side of the bridge.

Pavonia zeylanica, Cav.

An erect herb 2-4 ft. high. Branches slender. Leaves roundish, slightly cordate, 3-lobed (occasionally 5-lobed), toothed, minutely hairy, about 1 in. in diameter. Petiole $\frac{1}{2}$ - $1\frac{1}{4}$ in. long, covered with sticky hairs. Flower-stalks $1-1\frac{1}{4}$ in. long, jointed about three-fourths of their lengths from the base, covered with sticky hairs. Bracts of involucre linear, longer than the calyx. Corolla pink, a little over $\frac{1}{2}$ in. across. Ripe carpels rounded on the back, enclosed by the bracts of involucre. Flowers October to December.

Common in scrub jungle and also in waste places in the city.

Pavonia odorata, Willd.

பேராமுட்டி

An erect annual. Stem and branches covered with minute sticky hairs. Leaves roundish-ovate, cordate, 3- to 5-lobed or pointed, 1-2 in. long; lobes acute, distantly toothed, covered with short hairs on both surfaces. Petioles up to $2\frac{1}{2}$ in. long. Corolla pink. Flower-stalks $1-1\frac{1}{2}$ in. long, jointed near the flower. Bracts of involucre 10-12, linear. Carpels glabrous. Flowers in November.

Vandahur Hills.

Hibiscus panduraeformis, Burm.

A shrubby herb. Stem and branches covered with stiff hairs. Leaves only slightly lobed, irregularly toothed, cordate at base, surfaces covered with soft down and also with silky hairs, 2-3 in. long. Petiole hairy, $1\frac{1}{2}$ -3 in. long. Flowers standing singly on stout stalks about $\frac{1}{2}$ in. long. Bracts of involucre 6-9, half as long as the calyx. Calyx coarsely hairy, $\frac{5}{8}$ in. long; lobes 3-nerved. Corolla yellow with purple centre, hairy outside. Capsules ovoid, very hairy, over $\frac{1}{2}$ in. long. Seeds shaggy. Flowers after the rains.

In waste places, not common.

Hibiscus Solandra, L'Herit.

An erect annual herb. Leaves circular-ovate, cordate at base, crenate, upper ones deeply 3-lobed, long white hairs also present in addition to the short soft hair on both surfaces, $1\frac{3}{4}$ in. long. Petioles up to $2\frac{1}{2}$ in. long. Flowers standing singly in the axils of leaves. Flower-stalks jointed near the top. Calyx cup-shaped, with 5 obtuse lobes. Bracts absent. Corolla white, $\frac{1}{2}$ in. long. Capsule ovoid, beaked, hairy. Seeds 6 in each cell, bent like a horse-shoe, tubercled. Flowers in August and September.

On waste ground near the Salt Cotaurs. Chetpat. The distribution given for this species in Gamble's Flora is "Northern Circars, in Vizagapatam and Gōdāvari; Western Ghats and Coast from South Kanara to Tinnevely."

Hibiscus vitifolius, Linn. Vine-leaved Hibiscus.

மஞ்சள் துத்தி Pl. IV, F.

A tall annual herb. Stem very smooth due to soft minute hairs. Leaves 3- to 5-lobed, cordate at base, lobes serrate, acute or acuminate, softly hairy on both surfaces, 4-5 in. across. Petioles 2-3 in. long. Flowers clustered at the ends of branches or in the axils of leaves. Flower-stalks jointed about the middle. Bracts of involucre 7-12. Calyx $\frac{3}{4}$ in. long. Corolla sulphur-yellow with a purple centre, $2\frac{1}{2}$ in. across. Capsule 5-winged, with a short beak, resting on the bell-shaped calyx. Seeds minutely tubercled. Flowers July to March.

Common in waste places and in jungle.

Hibiscus tiliaceous, Linn.

தீர்ப்பருத்தி

A large shrub or a small tree, young parts softly and minutely hairy. Leaves roundish-ovate, cordate at base, somewhat abruptly acuminate at apex, minutely crenate

along the entire margin, under surface silvery, 4-5 in. in diameter. Flowers large and showy, at the ends of branches. Flower-stalks stout, about 1 in. long. Bracts of involucre forming a cup with 10 lobes. Calyx divided nearly to the base, $\frac{3}{4}$ in. long. Corolla yellow (turning red) with crimson centre, 2-3 in. across. Capsule softly hairy, round, shortly beaked, $\frac{3}{4}$ in. in diameter. Seeds kidney-shaped, smooth, black, minutely hairy. Flowers December to February.

On the banks of the Adyar, near the sea. Gamble in his Flora says as regards its distribution: "West Coast Districts along backwaters and tidal rivers from South Kanara southwards; perhaps also East Coast in the Deltas of the Godavari and other rivers though not recorded in herbaria available."

Hibiscus Trionum, Linn.

An annual herb sparsely covered with hairs. Leaves palmately divided almost to the base, lobes usually 3, each of the lobes again divided into 3-5 smaller lobes and toothed, covered with long stiff hairs, about $1\frac{1}{2}$ in. long. Petiole about $1\frac{1}{2}$ in. long. Flowers standing singly in the axils of leaves on stalks slightly longer than the petioles and jointed near the flower. Bracts of involucre 8-12, linear, half as long as the calyx. Calyx divided above the middle, many-nerved, covered with rough hairs. Corolla light yellow with a purple centre, $\frac{7}{8}$ in. across. Capsule oblong, softly hairy. Flowers in November.

On waste ground near Perambur. Not common. In Gamble's Flora the distribution for this species is given as "Deccan in Anantapur, Mysore, Coimbatore and North Nilgiris, common on black cotton soil."

In addition to the above wild species the following are common as cultivated plants:—

Hibiscus esculentus, Linn. Ladies' Fingers

வெண்ணடை பிண்டிச் செடி

An erect coarsely hairy herb. Leaves cordate, 3- to 5-lobed, covered with rough hairs. Flowers yellow with purple centre. Capsule ribbed, 6-9 in. long. Cultivated for its unripe capsules which are eaten as a vegetable.

Hibiscus cannabinus, Linn. Deccan Hemp

காசினிச் செடி நீர்நெல்

A prickly-stemmed herb. Leaves cordate, 3- to 5-lobed. Corolla light-yellow with purple centre. Capsules ovoid, beaked, very hairy. Cultivated for its valuable fibre. The young leaves are eaten in curries.

Hibiscus Sabdariffa, Linn. The Roselle

புளிச்சைக்கீரை

ఎఱ్ఱగొండు

A glabrous annual with reddish stem, leaves and fruit. Leaves 3- to 5-lobed, wedge-shaped at base. Lower leaves not lobed. Flowers standing singly. Calyx enlarging and becoming fleshy in fruit. Corolla sulphur-yellow with a purple centre. A native of the West Indies cultivated in gardens for its fleshy calyx which is used in making pickles and jelly. The leaves are eaten as a vegetable.

Hibiscus Rosa-sinensis, Linn. The Shoe Flower

செம்பரத்தை

దాసానిపెట్టు

A shrub. Leaves ovate, more or less acuminate, entire near the base, coarsely serrate towards the top. Calyx 1 in. long. Corolla red, yellow or white, sometimes double, 3 in. in diameter. A native of China and Northern India. Many varieties are grown in gardens.

Hibiscus syriacus, Linn.

A bushy shrub. Leaves wedge-shaped at base, the lower ones ovate, the upper ones more or less 3-lobed, up to 2 in. long. Corolla purplish lilac, with a dark purple eye, sometimes double. A native of Syria grown in gardens.

Gossypium, Linn. The Cotton Plants

Erect shrubs or herbs. Leaves 3- to 9-lobed. Bracts of involucre 3, large, usually cordate at base, toothed or entire, speckled with black dots. Ovary 5-celled; cells many-ovuled. Style club-shaped. Stigmas 5. Seeds densely clothed with cottony hairs.

Flowers wholly purple; bracts of involucre entire or toothed
and not cut into narrow pointed lobes arboreum.

Flowers yellow, bracts of involucre cut into narrow pointed
lobes; cotton easily separable from the seeds barbadense.

Gossypium arboreum, Linn.

செம்பருத்தி

పెట్టుపత్తి

A shrub. Branches purple, hairy. Leaves deeply palmately 5- to 7-lobed (an extra tooth sometimes present between the lobes), sparsely hairy, 2-3 in. long. Lobes oblong-lanceolate, tipped with a minute bristle. Petioles nearly as long as the leaf. Flower-stalks shorter than the petiole and jointed above the middle. Bracts of involucre almost entire. Corolla opening wide, purple, $1\frac{1}{4}$ in. long. Capsule oblong, pointed, about 1 in. long. Flowers in June and July.

Planted in gardens.

Gossypium barbedense, Linn.

பருத்தி மூடிச்செய்யு

A large much-branched shrub reaching up to 8 ft. high. Leaves deeply 3- to 5-lobed, cordate at base, the midrib with a gland beneath, dotted with black spots, up to 6 in. long and as broad; lobes ovate-oblong, acuminate. Petioles nearly as long as the leaves, dotted with black spots. Pedicels rather short. Bracts of involucre very large, cut into narrow pointed lobes. Corolla yellow with purple base. Capsules 3- to 5-celled, ovoid, acuminate. Seeds black, covered with readily separable cotton, without any underlying down. Flowers October to December.

An American species introduced for cultivation. Met with in gardens.

There are many varieties of cultivated cotton most of which are hybrids. Only the two species described above have come to my notice in Madras City.

Thespesia, Soland.

Trees clothed on their younger parts with small brown scales. Leaves entire. Flowers standing singly in the axils. Bracts of involucre 3, soon falling. Calyx truncate, entire. Ovary 5-celled. Ovules 2 or 3 in each cell. Styles club-shaped, 5-furrowed. Fruit a fleshy capsule. Seeds few, large, covered with soft hairs.

Thespesia populnea, Cav. The Portia or Tulip Tree

பூவாச Pl. VI, A. கங்காணி

A fair-sized evergreen tree. Leaves broadly-ovate, cordate, acuminate, prominently 5-nerved from the base, glabrous, 3-6 in. long and nearly as broad. Petiole 2-4 in. long. Flower-stalks nearly as long as the petiole. Flowers large and showy, 2-3 in. in diameter, sulphur-yellow with a purple centre, fading to pink. Fruit rounded, brown, about 1 in. in diameter. Flowers throughout the year.

Planted as a roadside tree. Wild along the backwaters at Ennur and at Adyar near the sea.

Adansonia, Linn.

Trees with short but very stout trunks. Leaves palmately compound. Flowers occurring singly. Calyx deeply 5-toothed. Staminal tube dividing above into numerous filaments. Ovary 5- to 10-celled. Fruit with a woody case, pulpy inside.

Adansonia digitata, Linn. The Baobab Tree

ஆனைப்பழையமரம்

A tree with a comparatively short but very stout trunk. Leaves with 3-7 obovate-oblong leaflets, falling away before the hot weather commences. Flowers large, pendent, appearing with the leaves. Calyx silky inside and softly hairy on the outside, 5-lobed;

lobes 2 in. long. Petals white. Fruit large, cylindrical, hanging by their stalks, containing an acid edible pulp. Flowers May to August.

Planted in gardens. It is a native of Africa.

Bombax, Linn.

Trees with buttressed trunks, branching only at a considerable distance from the ground. Leaves palmately compound. Bracts absent. Calyx leathery, cup-shaped. Stamens very numerous, in many bundles. Ovary 5-celled. Ovules numerous. Style dividing into 5. Capsule woody. Seeds embedded in white silky wool.

Bombax malabaricum, DC. The Red Silk-cotton Tree

இலவம்

మండ్లబూరుగు చెట్టు

A large tree. Leaflets 5-7, lanceolate, entire, tipped with a sharp point, glabrous, 3-7 in. long. Main petiole 8 in. long. Stalks of leaflets up to 1 in. long. Calyx densely silky inside. Corolla large, bright red. Capsule woody, 4-5 in. long. Seeds packed in white cotton. Flowers in March and April when the tree stands quite bare of leaves.

Often planted. Museum compound. The cotton obtained from the capsules is used for stuffing cushions and pillows.

Eriodendron, DC.

Trees. Leaves palmately compound. Leaflets entire. Bracts absent. Flowers yellowish. Stamens in 5 bundles opposite to the petals, united at base. Ovary 5-celled. Cells many-ovuled. Style cylindrical. Capsule woody. Seeds enveloped in copious floss.

Eriodendron pentandrum, Kurz (Eriodendron anfractuosum, DC.)

பஞ்சமரம்

The White Silk-cotton Tree

బూరుగు

A tall tree. Trunk prickly when young. Branches horizontal, standing in threes. Petioles 4-6 in. long. Leaflets 5-8, lanceolate, glabrous, 2-4 in. long. Flowers appearing with young leaves on branches, whitish, 1½-2 in. in diameter. Capsule enlarged at the middle and narrowed at the ends. Flowers in March.

A native of South America and the West Indies occasionally cultivated in gardens. The floss from the capsule, known as "Kapok", is used for stuffing pillows and cushions and is considered superior to that of *Bombax malabaricum*.

Anoda hastata, Linn.

A blue-flowered, herbaceous, hispid, introduced weed mentioned in Gamble's Flora as occurring near Madras but not collected by me. Possibly it has disappeared.

Sterculiaceae

Herbs, shrubs or trees, the younger parts usually covered with minute star-shaped hairs. Leaves alternate, having stipules. Flowers bi-sexual, sometimes uni-sexual. Sepals and petals 5 each, the latter sometimes absent. Stamens 5 to many. Filaments united into a tube. Anthers 1-5, clustered together. Sterile stamens sometimes present. Ovary 4- or 5-celled, at times only 1-celled. Ovules 2 to many in each cell. Styles as many as the cells of the ovary, distinct or united together.

1	Petals absent; flowers uni-sexual; fruit a follicle	...	...	...	...	Sterculia
	Petals present; flowers bi-sexual; fruit a capsule or woody.	2				(cultivated).
2	Staminal tube adherent to the pistil	...	...	...	...	3
	Staminal tube not adherent to the pistil but enclosing it	...				4
3	Fruit a spirally-twisted follicle	...	...	...	...	Helicteres.
	Fruit a capsule; seeds winged	...	...	...	...	Pterospermum.
4	Sterile stamens absent	...	...	...	...	5
	Sterile stamens present	...	...	...	...	6
5	Styles 5; ovary 5-celled	...	...	...	...	Melochia.
	Style single; ovary 1-celled, 1-seeded	...	...	...	...	Waltheria.
6	Trees	...	...	...	...	Guazuma.
	Herbs	...	...	...	...	Pentapetes

Sterculia, Linn.

Members of this genus do not grow wild near Madras but are found in other parts of the Presidency. *Sterculia foetida*, Linn., a large deciduous tree with large palmately-compound leaves, dull orange-coloured flowers and large woody scarlet follicles, a native of the West Coast, is found in a number of Madras gardens.

Helicteres, Linn.

Shrubs or trees. Calyx 5-toothed. Petals 5. Staminal column elongated, adherent to the pistil, 5-toothed. Anthers in groups at the top of the column between the teeth. Ovary at the top of the column, 5-lobed, 5-celled. Ovules many in each cell. Fruit consisting of 5 follicles twisted together into a helix.

Helicteres Isora, Linn.

உலம்பிரி நாயகம்

A large shrub. Leaves unequal-sided, obovate, serrate, with cordate bases, rough above, softly hairy below, 3-5 in. long. Flowers standing singly or few together in the axils, red, fading to light blue, $\frac{1}{2}$ in. long. Fruit $2\frac{1}{2}$ in. long. Flowers August to December.

In hill-forests, as at Vandalur,

Pterospermum, Schreb.

Trees or shrubs. Leaves tough, often unequal-sided. Sepals and petals soon falling. Stamens in 5 groups of 3 each standing between sterile stamens. Ovary 5-celled, many-ovuled.

Pterospermum suberifolium, Lamk.

பா. திரி மூசுசுண்டமு

A moderate-sized tree. Leaves obovate-oblong, softly hairy and cream-coloured below, 2-4 in. long. Flowers standing singly or few together in the axils of leaves, white, scented, $1\frac{1}{2}$ -2 in. in diameter. Fruit a woody capsule, up to 2 in. long. Seeds winged at one end. Flowers September to December.

Vandalur Hills.

Melochia, Linn.

Herbs. Flowers in clusters. Petals soon falling. Stamens 5, opposite to the petals. Ovary 5-celled, with 2 ovules in each cell. Styles 5. Fruit a capsule.

Flowers in densely-crowded clusters at the ends of branches corchorifolia.

Flowers in densely-crowded clusters in the axils of leaves ... nodiflora.

Melochia corchorifolia, Linn.

An erect branched herb. Stem and branches almost glabrous. Leaves ovate-lanceolate, serrate, acute at apex, slightly 3-lobed, almost glabrous on both surfaces, $1\frac{1}{4}$ -3 in. long. Flowers pink, $\frac{1}{8}$ in. in diameter. Capsules roundish, hairy. Flowers October to December.

A very common weed of waste places and fallow fields.

Melochia nodiflora, Sw.

Pl. V. C.

An erect herb. Stem and branches sparingly hairy. Leaves ovate, serrate, acuminate at apex, hairy on both sides, 2-3 in. long. Flowers pink, very densely crowded together into globose heads in the axils of leaves. Capsules roundish, hairy. Flowers October to December.

This is a native of Central America and the West Indies. It has become established near Kilpauk and Adyar in waste places. This appears to be a newly introduced weed as no previous record has been found.

Waltheria, Linn.

Herbs or shrubs. Flowers small, in dense clusters. Calyx 5-toothed. Petals soon falling. Stamens 5, opposite to the petals, united below. Ovary 1-celled. Ovules 2. Style arising from the apex of the ovary but not vertical. Capsule 1-seeded, breaking open into halves.

Waltheria indica, Linn.

Pl. V, A.

An erect herb 2-3 ft. high, covered with dense soft hairs. Leaves elliptic or ovate, serrate, obtuse at apex, softy hairy on both surfaces and having prominent nerves, 1-2½ in. long. Flowers yellow. Fruit very small, enclosed by the hairy calyx. Flowers October to February.

Found amongst under-growth in the jungle at Vandalur. Ennur, on the north side of the backwater. In waste places near Vepery.

Guazuma, Plum.

Trees. Flowers in cymes in the axils. Petals 5, prolonged above into two long, narrow structures. Stamens united into a tube below. Filaments 10, 5 bearing 3 anthers each and alternating with the other 5 that bear one sterile anther each. Ovary 5-celled, 5-lobed. Fruit round, woody, warty, with many seeds.

Guazuma tomentosa, Kunth

தேன்மரம்

Pl. V, B.

தேன்மரம்

A moderate-sized deciduous tree. Leaves rough, the two halves unequal, ovate-lanceolate, serrate, acuminate, cordate at base, hairy on both sides, 2-5 in. long. Flowers clustered in the axils, small, bright yellow; prolongations of petals reddish. Fruit oblong, 1 in. long. Flowers August to November.

This is a native of Tropical America. It is frequently planted and has run wild in places.

Pentapetes, Linn.

Herbs. Leaves lanceolate. Fertile stamens 15, disposed in 5 groups of 3 each. Sterile stamens 5, alternating with the fertile groups. Ovary 5-celled, many-ovuled. Fruit a capsule.

Pentapetes phoenicia, Linn.

An erect branched annual herb 2-5 ft. high. Stem not hairy. Leaves serrate, sometimes obscurely 3-lobed, acute at apex, not hairy, 2-5 in. long. Flowers very showy, red, opening at noon. Flowers in November.

This is a native of Bengal and North-west Frontier Provinces. It is not indigenous to South India, but it is not uncommon in paddy fields in the rainy weather. On the sides of the road to Red Hills and also near Poonamallee.

Tiliaceae

Plants with alternate leaves having stipules. Sepals and petals usually 5 each. Stamens few or many. Filaments free. Ovary 2- to 10-celled. Ovules 1 or many in each cell. Fruit a capsule or woody berry.

- | | | | | | | | | |
|---|--|-----|-----|-----|-----|-----|-----|-------------|
| 1 | Fruit winged | ... | ... | ... | ... | ... | ... | Berrya. |
| | Fruit not winged | ... | ... | ... | ... | ... | ... | 2 |
| 2 | Fruit a drupe | ... | ... | ... | ... | ... | ... | Grewia. |
| | Fruit a capsule | ... | ... | ... | ... | ... | ... | 3 |
| 3 | Capsule covered with prickles | ... | ... | ... | ... | ... | ... | Triumfetta. |
| | Capsule not covered with prickles, elongated | ... | ... | ... | ... | ... | ... | Corchorus. |

Berrya, Roxb.

Trees. Leaves ovate, acuminate. Stamens many. Ovary 3-celled with 4 ovules in each cell. Capsule with 6 wings.

Berrya Ammonilla, Roxb. Trincomalee Wood

திரிசுக் காண மலைமரம்

Leaves with cordate bases, 4-8 in. long. Flowers small, white. Anthers gold-coloured. Capsule rounded; wings netted.

A native of Ceylon planted in avenues and in gardens. The timber is valuable and is employed in the construction of boats.

Grewia, Linn.

Trees or shrubs. Leaves 3- to 7-ribbed. Flowers yellow, in cymes or in clusters in the axils or by the side of the axils of leaves or at the ends of branches. Sepals 5. Petals 5, usually with a gland at the base on the inside, usually shorter than the sepals. Stamens numerous. Ovary of 2-4 cells. Ovules 2 to many. Fruit entire or lobed, resembling a drupe or a berry.

- | | | | | | | | | |
|---|--|-----|-----|-----|-----|-----|-----|-------------|
| 1 | Fruit not lobed | ... | ... | ... | ... | ... | ... | obtusa. |
| | Fruit deeply or slightly lobed | ... | ... | ... | ... | ... | ... | 2 |
| 2 | Fruit deeply lobed | ... | ... | ... | ... | ... | ... | disperma. |
| | Fruit slightly lobed | ... | ... | ... | ... | ... | ... | 3 |
| 3 | Two halves of leaves not meeting at the base, hairy | ... | ... | ... | ... | ... | ... | 4 |
| | Two halves of leaves meeting at the base, glabrous | ... | ... | ... | ... | ... | ... | orientalis. |
| 4 | Leaves roundish-ovate, 5 nerves originating at the base; | | | | | | | |
| | drupe hard and woody | ... | ... | ... | ... | ... | ... | villosa. |
| | Leaves narrow, lanceolate, 3 nerves originating at the | | | | | | | |
| | base; drupe fleshy | ... | ... | ... | ... | ... | ... | hirsuta. |

154409

5625
143

Grewia obtusa, Wall. (*Grewia bracteata*, Wt. & Arn.)

A shrub. Leaves ovate-lanceolate, serrate, the two halves slightly unequal, 3 nerves originating at base, more or less acute at apex, glabrous, $1\frac{1}{2}$ -3 in. long. Peduncles as long as the leaf-stalk, 1- to 3-flowered. Buds ovoid, tapering at one end. Sepals covered with soft down, $\frac{3}{4}$ in. long. Petals much shorter than the sepals, oblong, entire, curved backwards. Fruit covered with yellow hairs, shrivelled when dry, $\frac{2}{3}$ -1 in. in diameter. Flowers December to February.

In scrub jungle.

A variable plant. Ennur specimens differ much from Avadi specimens. Mr. Fischer has not included this species in his Forest Flora of East Central Madras.

Grewia disperma, Rottl. (*Grewia laevigata*, Vahl.)

A small tree or a shrub. Leaves lanceolate, acuminate, sharply serrate, glabrous, shiny above, 3 nerves originating at base, $1\frac{3}{4}$ -3 in. long. Flowers in umbel-like cymes. Buds ovoid or roundish, ribbed, softly hairy. Peduncles longer than the leaf-stalks. Sepals up to $\frac{1}{2}$ in. long. Petals white, much shorter than the sepals. Fruit yellow, deeply 2-lobed. Flowers August to December. The tree stands bare of leaves in the hot weather and the young leaves appear in July.

Vandalur Hills.

Grewia orientalis, Linn. (*Grewia columnaris*, Sm.)

A shrub, younger parts covered with short rough hairs. Leaves ovate-oblong or elliptic-oblong, slightly acuminate, crenate-serrate, glabrous except on the nerves on the under side, 3 nerves originating at base, fairly thick, 2-3 in. long. Flowers in small umbel-like cymes. Buds ovoid-oblong, softly hairy, ribbed. Sepals $\frac{3}{4}$ -1 in. long. Petals much shorter, white. Fruit yellow, wrinkled, $\frac{3}{4}$ in. in diameter. Flowers May to September.

Vandalur Hills.

Grewia villosa, Willd.

A shrub. Branches covered with minute soft hairs. Leaves circular-ovate, halves not meeting at the base and slightly cordate, finely serrate, often minutely acuminate, 5-nerved at base, covered with velvety hairs beneath, $1\frac{1}{2}$ -3 in. in diameter. Flowers arranged in cymes in the axils of leaves or opposite to them. Buds elliptical, softly hairy. Petals much shorter than sepals, dull yellow. Drupes globose, about $\frac{1}{2}$ in. in diameter, yellowish-red, rind hard and woody, hairy. Flowers in the rainy months. Fruit ripening in August.

Vandalur Hills.

Grewia hirsuta, Vahl

Pl. V, D.

A small shrub, younger parts covered with woolly hairs. Leaves narrow, lanceolate serrate, acute, densely hairy below, halves not meeting at the base, 3 nerves originating at base, 2-3 in. long. Flowers in umbel-like cymes in the axils of leaves. Leaf-stalks densely hairy. Buds ovoid, densely hairy. Sepals $\frac{1}{4}$ in. long. Petals white. Drupe fleshy, wrinkled, yellow, $\frac{1}{4}$ in. in diameter. Flowers February to August.

Very common on Vandalur Hills. It appears at altitudes of about 200 ft. above sea level. Mr. Fischer records it as appearing in forests 1,000-4,000 ft. above sea level.

Triumfetta, Linn.

Herbs or shrubby herbs. Flowers yellow. Sepals and petals 5 each, the latter thickened at the base. Stamens varying in number. Ovary 5-celled; cells of 2 ovules. Capsule round or ovoid, covered with spiny bristles, not always splitting open. Seeds 1 or 2 in each cell.

- | | | |
|---|---|---------------|
| 1 | Fruit ovoid | pentandra. |
| | Fruit globose | 2 |
| 2 | Lower leaves 3- to 5-lobed; spines of fruit glabrous; | |
| | stamens 8-15 | rhomboidea. |
| | Lower leaves circular; spines of fruit covered with short | |
| | soft hairs; stamens 15-25 | rotundifolia. |

Triumfetta pentandra, A. Rich. (*Triumfetta neglecta*, Wt. & Arn.)

An annual shrubby herb. Branches hairy. The lower leaves ovate and 3-lobed; the upper ones lanceolate, irregularly serrate, sparsely hairy on both surfaces, the under surface more hairy than the upper, 1-2½ in. long. Flowers small. Stamens 5-13. Fruit ovoid, with spiny hooked bristles fringed with minute hairs on one side. Flowers September to November.

In the scrub jungle at Avadi and on the Vandalur Hills.

Triumfetta rhomboidea, Jacq.

ஆடையாட்டி

A shrubby herb 2-5 ft. high. Leaves variable, the lower ones usually 3-lobed, irregularly serrate, base usually wedge-shaped, hairy on both surfaces, 2-3 in. in diameter. Flowers in dense cymes opposite to the leaves and at the ends of branches. Fruit $\frac{1}{6}$ in. in diameter. Flowers October to December.

A very common weed in gardens and waste places.

Triumfetta rotundifolia, Lamk.

A shrubby herb. Leaves circular, irregularly toothed, upper surface very sparingly hairy, the lower clothed with short soft grey hairs, $\frac{3}{4}$ -1½ in. long. Flowers $\frac{1}{4}$ in. across, in irregular racemes. Fruit ovoid, $\frac{1}{6}$ in. long. Flowers December to February.

Ennur, in the scrub jungle near the salt pans.

Corchorus, Linn.

Herbs. Leaves serrate. Flowers, small, yellow. Stamens numerous. Ovary 2- to 5-celled. Ovules many in each cell. Fruit an elongated or roundish capsule.

- | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|---------------|
| 1 Capsule roundish | ... | ... | ... | ... | ... | ... | capsularis. |
| Capsule elongated | ... | ... | ... | ... | ... | ... | 2 |
| 2 Capsule ending in 3 radiating points | ... | ... | ... | ... | ... | ... | acutangulus. |
| Capsule ending in a single beak slightly divided at the tip. | 3 | | | | | | |
| 3 Capsule 1-3 in. long, 10-ribbed, glabrous, splitting along 5 lines; leaves ovate-lanceolate | ... | ... | ... | ... | ... | ... | olitorius. |
| Capsule $\frac{1}{2}$ in. long, not ribbed, covered with short soft hairs, splitting along 3 lines; leaves oblong | ... | ... | ... | ... | ... | ... | fascicularis. |

Corchorus capsularis, Linn. The Jute Plant

An erect annual. Leaves lanceolate, serrate, tapering at the apex, glabrous, 3-4 in. long. Flowers less than $\frac{1}{2}$ in. across, arranged in short cymes. Capsule, roundish, broader than long, ridged, beset with short protuberances, $\frac{1}{2}$ in. in diameter. Flowers in December and January.

A rather rare weed in Madras. Collected on the Nungambakam High Road. It is not truly indigenous to India. Its native country is not known. Extensively cultivated in Bengal for the fibre known as Jute.

Corchorus acutangulus, Lamk.

A branching annual. Leaves ovate, acute, serrate, almost glabrous, $\frac{1}{2}$ -3 in. long. Flowers small, in cymes opposite to the leaves. Capsule $\frac{3}{4}$ -1 $\frac{1}{2}$ in. long, 6-angled, 3 of the angles winged. Beak of capsule 3-branched. Flowering and fruiting after the rains and continuing till March.

A very common weed found by the side of ponds and in cultivated places.

Corchorus olitorius, Lamk. The Jute Plant

சுணல்

Pl. V, E.

An erect annual growing up to 3-4 ft. Stems glabrous. Leaves elliptic-lanceolate, tapering at apex, serrate, glabrous, the lowest tooth on either side prolonged into two small slender filaments, 2 $\frac{1}{2}$ -4 in. long. Flowers pale yellow. Capsule erect, 10-ribbed, beaked, glabrous, splitting along 5 lines, 1 $\frac{1}{4}$ -2 $\frac{1}{2}$ in. long. Flowers November to January.

In paddy fields at Nungambakam. Not cultivated in Madras. Commercial jute is obtained from the stems of this plant as well as from *Corchorus capsularis*.

Corchorus fascicularis, Lamk.

A short annual. Leaves elliptic-oblong, obtuse, serrate, glabrous, $\frac{3}{4}$ - $1\frac{1}{2}$ in. long. Flowers in very short cymes opposite the leaves. Capsule shortly beaked, straight, splitting along 3 lines, $\frac{1}{2}$ in. long. Flowers November to January.

In waste places at Adyar.

Linaceae

Herbs or shrubs. Leaves simple, alternate. Sepals and petals 4-6 each, the latter soon falling. Stamens as many or twice as many as the petals. Sterile stamens often also present alternating with the fertile ones and united with them at the base. Ovary 3- to 5-celled with one or two ovules in each cell.

Herbs Linum.

Shrubs ; the flower-bearing region having a pair of spiral hooks

at its base Hugonia.

Linum, Linn.

Leaves without stalks. Styles 5. Ovary 5-celled with 2 ovules in each cell, or as a result of division 10-celled with 1 ovule in each cell.

Linum usitatissimum, Linn. The Flax Plant

ஆளி

பச்சி

An annual herb with round wiry stem branching at the top. Leaves linear, 3-nerved about 1 in. long. Flowers in the axils of leaves, about 1 in. across. Petals blue, falling quickly. Stamens 5, connected below with alternating sterile staminodes. Ovary 5-celled. Capsule 10-seeded. Flowers in January and February.

A casual weed on rubbish heaps. Cultivated elsewhere for its seed which is the source of linseed oil and for the stem which yields the fibre known as flax. The native country of this plant is not definitely known though some are of opinion that it may have been Egypt.

Hugonia, Linn.

Shrubs, climbing by the help of spiral hooks. Sepals and petals 5 each, the latter fading and falling quickly. Stamens 10, united at their bases. Ovary 5-celled. Ovules 2 in each cell. Styles 5. Fruit a drupe.

Hugonia mystax, Linn.

மோதிரக் கண்ணி

Pl. VI, B.

கூழி

A large shrub. Branches softly hairy ; branchlets provided with pairs of curved hooks (transformed peduncles). Leaves elliptic-obovate, base tapering, glabrous, $1\frac{1}{2}$ - $2\frac{1}{2}$ in. long. Flowers at the ends of short branchlets, in the axils of leaves, over 1 in. across.

Petals bright yellow, scented. Drupe $\frac{3}{8}$ in. in diameter, surrounded by the persistent sepals. Flowers in August.

In the scrub jungle at Avadi and on the Vandalur Hills.

Zygophyllaceae

Herbs (or shrubs) with opposite pinnately compound leaves. Stipules present. Flowers 1 or 2 in the axils of leaves. Sepals 5. Petals 5, imbricate in bud. Stamens as many or twice as many. Ovary 5-celled with 1 to few ovules in each cell.

Tribulus, Linn.

Herbs spreading on the ground. Leaves with an even number of leaflets. Stamens 10.

Tribulus terrestris, Linn.

தெரிஞ்சி Pl. VI, C. పల్లెడు

Stems many, branching from the base. Leaves of each pair unequal, the larger ones alternating to right and left. Leaflets small, oblong, 3-7 pairs. Flowers yellow, star-shaped. Fruit roundish, woody, with a few hard stout spines. These penetrate the skin of those walking barefoot and this is probably the means of dispersal of the seeds. In flower almost all through the year.

A very common weed met with everywhere. The plant is used in medicine.

Geraniaceae

Plants having alternate, stipulate, usually compound leaves (in Impatiens simple leaves). Sepals 5 (in Impatiens 3), imbricate. Petals 5. Stamens 5 or 10. Ovary 5-celled. Fruit usually a capsule but sometimes a berry.

- | | | | | | |
|---|--|-----|-----|-----|----------------------------|
| 1 | Leaves compound; sepals alike; petals alike | ... | ... | ... | 2 |
| | Leaves simple; sepals unlike; petals unlike | ... | ... | ... | Impatiens
(cultivated). |
| 2 | Herbs; fruit a capsule | ... | ... | ... | 3 |
| | Trees; fruit a berry | ... | ... | ... | Averrhoa
(cultivated). |
| 3 | Leaflets 3, joined together at the end of the leaf-stalk | ... | ... | ... | Oxalis. |
| | Leaflets many, pinnately arranged | ... | ... | ... | Biophytum. |

Impatiens, Linn. The Balsams

Several species of Impatiens are cultivated in gardens. Those that seed are annuals. The sepals are coloured like the petals and the lowest one is produced into a hollow spur. The capsules when ripe burst open in such a way as to eject the seeds to some distance.

Averrhoa, Linn

Averrhoa Bilimbi, Linn. The Bilimbi

புளிச்சைக்காய்

बिलंबी

A small cultivated tree. Leaves compound. Leaflets 11-35, oblong, up to 2 in. long. Fruit ribbed, attached to trunk or older branches, very acid in taste.

Averrhoa Carambola, Linn.

தமரத்தை

शमर

A small tree. Leaves compound. Leaflets 5-11, ovate-oblong. Fruit ribbed. Less common than the last.

The native countries of both the above are unknown.

Oxalis, Linn.

Small herbs with acid-tasting leaves. Flowers in umbels, on long stalks. Stamens 10. Styles 5. Fruit a narrow capsule splitting open along 5 lines.

Oxalis corniculata, Linn. Yellow Wood-sorrel

புளியாரை

Pl. VI, D.

पुलीचोरा

Stem slender, running horizontally on the ground and rooting at the nodes. Leaflets attached to the end of a slender stalk $1\frac{1}{2}$ -3 in. long, obcordate, $\frac{1}{2}$ in. long. Flowers yellow, $\frac{1}{4}$ - $\frac{1}{2}$ in. across. Capsule linear-oblong, beaked at apex, $\frac{3}{4}$ in. long, many-seeded. Flowers in the rainy and cold weather.

A very common, often troublesome weed in gardens. The leaves are used for chutneys and also in medicine.

Biophytum, DC.

Herbs. Leaves crowded at the ends of stems and branches, having an even number of leaflets. Flowers in small umbels. Sepals 5. Petals 5, yellow. Stamens 10, the inner 5 longer. Ovary 5-celled. Styles 5. Capsule splitting along 5 lines.

Biophytum sensitivum, DC.

செஞ்சூ

An annual herb. Stem erect, 1-10 in. long. Leaves sensitive, crowded into a rosette at the top of the stem. Leaflets 6-15 pairs, the end pair the largest, oblong, $\frac{3}{8}$ in. long. Flowers yellow, $\frac{1}{3}$ in. across. Flower-stalks springing from the same point but of various

lengths. Capsule ellipsoid, slightly longer than the sepals. Cells few-seeded. Flowers in the rainy weather.

On the borders of a pond close to Luz Church. This plant is reported to have been once very common near Madras, particularly in the paddy fields near Nungambakam. It is tending to disappear.

Several varieties of *Pelargonium*, commonly known as *Geranium*, are cultivated in gardens but none are indigenous to India. The essential oil commonly known as *Geranium oil* is not got from any species of *Pelargonium* but from *Rosa* grass or *Geranium* grass, *Andropogon Schoenanthus*, Linn.

Rutaceae

Shrubs or trees with simple or pinnately compound leaves dotted with oil-glands. Calyx 4- or 5-lobed. Petals 4 or 5. Stamens as many or twice as many as the petals or numerous. Ovules 2 or numerous in each cell. Fruit usually a fleshy or woody berry.

- | | | |
|---|--|-----------------------|
| 1 | Plants not armed with thorns or prickles | 2 |
| | Plants armed with thorns or prickles | 4 |
| 2 | Style short, remaining on the fruit | Glycosmis. |
| | Style long, falling away before the ovary develops into the fruit | 3 |
| 3 | Filaments dilated below; anthers rather large; petals 4 (in local species) | Clausena. |
| | Filaments not dilated below; anthers small; petals 5, never 4 | Murraya (cultivated). |
| 4 | Leaves compound | 5 |
| | Leaves apparently simple | 7 |
| 5 | Leaflets 3 | 6 |
| | Leaflets more than 3; leaf-stalk and rachis winged | Feronia. |
| 6 | Trees armed with spines; flowers bi-sexual; stamens numerous... .. | Aegle. |
| | Shrubs armed with small prickles; flowers either having stamens only or ovary only; stamens in male flowers as many as petals | Toddalia. |
| 7 | Stamens 6-8; ovary not more than 5-celled | Atalantia. |
| | Stamens numerous; ovary many-celled | Citrus (cultivated). |

Glycosmis, Correa

Shrubs. Leaflets alternately arranged. Flowers in panicles, small. Stamens 8-10. Ovary 2- to 5-celled with one ovule in each cell. Fruit a berry with 1-3 seeds.

Glycosmis cochinchinensis, Pierre (*Glycosmis pentaphylla*, Correa)

கொஞ்சி

Pl. VI, E.

A shrub. Leaflets 3-5 or sometimes single, elliptic-lanceolate, glabrous, having an unpleasant smell when crushed, 2-8 in. long. Flowers whitish. Ovary 5-celled. Berry roundish, whitish, $\frac{3}{8}$ in. in diameter. Flowers during most parts of the year.

On open ground where it forms a scrubby growth. Pallavaram. Vandalur.

Clausena, Burm.

Shrubs or trees. Leaflets alternate. Flowers small. Sepals and petals 4 or 5 (4 in local species). Stamens 8-10. Filaments dilated at the tip, alternately longer and shorter. Anthers rather large. Ovary 4- or 5-celled. Ovules 2 in each cell. Berry 2- to 5-celled.

Clausena Willdenovii, Wt. & Arn.

A large shrub. Leaflets 5-15, ovate, the two halves unequal, 2-4 in. long. Flowers in racemes in the axils of leaves, small, greenish-yellow, scented. Fruit ovoid, greenish, edible, $\frac{1}{2}$ in. in diameter. Flowers June to September.

Guindy Park.

Murraya, Linn.

Shrubs or small trees. Two halves of leaflets unequal. Stamens 10, the 5 longer ones alternating with the 5 shorter. Ovary 2- to 5-celled with 1 or 2 ovules in each cell. Fruit a 1- or 2-celled berry.

Leaflets 3-7; flowers few, in the axils of leaves; petals $\frac{1}{2}$ in.

long; berry red *exotica*.

Leaflets 11-25; flowers many, in corymbs at ends of branches;

petals $\frac{1}{5}$ in. long; berry black *Königii*.

Murraya exotica, Linn.

A large shrub. Leaves shiny, ovate-elliptic, $1\frac{1}{2}$ -3 in. long. Flowers white, strongly scented. A native of the Eastern Ghats cultivated in gardens.

Murraya Kiongii, Spreng. The Curry-leaf Plant

கருவேப்பிலை

కరివేప

A large shrub. Leaves very aromatic, $\frac{3}{4}$ -2 in. long. Flowers small, white. A native of the Eastern and Western Ghats much cultivated for the sake of its leaves which are used in flavouring curries.

Feronia, Gaertn.

Trees armed with spines. Leaflets opposite, entire. Uni-sexual flowers also present along with bi-sexual flowers. Petals 5, spreading. Stamens 10-12. Ovary at first 5- or 6-celled, later 1-celled. Style absent. Fruit a large round 1-celled berry with a rough, woody rind.

Feronia Elephantum, Correa. The Wood-apple Tree

விளா

வெங்கட்டை

A large thorny tree. Leaflets 3-9, aromatic, opposite, obovate or wedge-shaped, glabrous, shiny, 1-2 in. long. Leaf-stalk and axis of leaf flat, winged. Flowers reddish, in panicles in the axils of leaves or at ends of branches; male and female flowers often present in the same panicle. Fruit round, hard, with grey woody shell, 2-3 in. in diameter. Seeds embedded in sour edible pulp. Flowers in March and April.

In dry open land. Often grown in gardens.

Aegle, Correa

Trees armed with spines. Leaves having 3 leaflets. Flowers rather large, in panicles in the axils of leaves. Calyx small, soon falling. Petals spreading, imbricate. Stamens numerous. Ovary 8- to 20-celled. Ovules numerous in each cell. Fruit a large, 8- to 15-celled berry; the shell woody and smooth. Seeds embedded in aromatic pulp.

Aegle Marmelos, Correa. The Bael Tree

விவிலம்

மாச்சு

A tree armed with straight sharp spines. Leaflets 3, elliptic-lanceolate or lanceolate, glabrous, the side ones almost stalkless, the end one on long stalk, 1½-3 in. long. Flowers greenish-white, scented. Petals 4, tough, ½ in. long. Fruit round, 2-5 in. in diameter; shell grey or yellowish; pulp sweet, orange-coloured. Fruit ripening March to August.

Cultivated near temples and occasionally in gardens. This tree is most sacred to God Shiva and the leaves are used in the worship of that deity. The fruit is used medicinally.

Toddalia, Juss.

Erect or climbing prickly shrubs. Leaves with 3 leaflets. Flowers small, male and female in the same panicle. Calyx 5-lobed. Petals 5, valvate. Stamens in male flowers as many as the petals, surrounding a sterile ovary. Ovary in female flowers 5- or 6-celled. Ovules 2 in each cell. Style absent. Berry 4- to 6-celled. Seeds one in each cell.

Toddalia asiatica, Lamk. (Toddalia aculeata, Pers.)

மிளகரணை

செங்குந்த

A slender very thorny shrub. Leaflets elliptic-lanceolate, not stalked, very slightly crenate, slightly notched at apex, glabrous, many-nerved, midrib prickly, 1-3 in. long.

Flowers in panicles in the axils of leaves and at the ends of branches, small, white. Fruit a small yellow berry, rind pitted, about $\frac{1}{4}$ in. in diameter. Flowers August to February.

Guindy Park and neighbourhood. Pallavaram. Vandalur Hills.

Atalantia, Correa

Evergreen trees, generally armed with spines. Leaves apparently simple. Flowers in clusters in the axils of leaves. Calyx 3- to 5-lobed. Petals 3-5, free or adherent to the stamens and united with them in a tube, imbricate. Stamens 6-8. Filaments free or united into a tube. Ovary 2- to 4-celled. Ovules 1 or 2 in each cell. Fruit a fairly large round berry, 1- to 5-celled; one seed to each cell.

Atalantia monophylla, Correa

காட்டுநாரங்கம்

Pl. VI, F.

அடவாறு

A medium-sized thorny tree. Leaflets elliptic or ovate-oblong, glabrous, tough, notched at apex, 1-3 in. long. Flowers white, $\frac{1}{2}$ in. across. Stamens 8, united into a tube. Ovary 4-celled, with 1 ovule in each cell. Fruit green, round, $\frac{1}{2}$ -1 in. across. Flowers November to February.

Guindy Park. Adyar.

Citrus, Linn.

Shrubs or trees; branches spiny. Leaves apparently simple. Leaf-stalk winged. Calyx cup-shaped. Petals 4-8, thick, white. Stamens numerous. Filaments variously united. Ovary many-celled. Ovules 4-8 in each cell, in 2 series. Fruit a berry.

- | | | | | | | |
|---|---|-----|-----|-----|-----|------------|
| 1 | Young shoots and leaves glabrous | ... | ... | ... | ... | 2 |
| | Young shoots and underside of leaves softly hairy | ... | ... | ... | ... | decumana. |
| 2 | Young shoots purple; petals tinted with red | ... | ... | ... | ... | medica. |
| | Young shoots greenish-white; petals white | ... | ... | ... | ... | Aurantium. |

Citrus decumana, Murr. The Pumelo

பொம்பளிமாஸ்

పంపరపప

A native of Malaya and Polynesia commonly cultivated in Madras gardens.

Citrus medica, Linn.

This includes Citrus medica proper, the Citron, நாரத்தை, நாரத்தையெழு; var. Limonum, the Lemon, பெரிய எலுமிச்சை, வெள்ளை; and var. acida, the Sour Lime, எலுமிச்சை, நெய்யெழு. Occasionally cultivated in Madras gardens but not with quite successful results.

Citrus Aurantium, Linn. The Orange

செங்காயம்

நாரஞ்சு

Several varieties are cultivated in gardens in Madras. There is one good variety cultivated near Puthur about fifty miles from Madras.

Ochnaceae

Trees or shrubs. Leaves alternate, simple, having stipules. Sepals 4-5. Petals 4-12, soon falling, opening wide, imbricate in bud. Disk surrounding the ovary thick. Stamens numerous, inserted at the base of the disk. Filaments usually short, remaining on the fruit. Ovary short, 2- to 10-lobed. Fruit forming a group of drupes or berries, each having 1-4 seeds.

Ochna, Linn.

Leaves shiny. Flowers arranged in panicles. Sepals 5, yellow, remaining on the fruit. Petals 5-12, yellow, falling away quickly. Stamens shorter than the petals. Ovary with 3-10 deep lobes so that the whole appears to be 3-10 separate ovaries. Ovules 1 in each cell. Drupes 3-10.

Ochna squarrosa, Linn.

Pl. VII, A.

சுக்க-மேரு

A small tree. Leaves thin, elliptic-obovate, pointed at apex, finely toothed, veins numerous and running parallel to each other, glabrous, shiny, 2-5 in. long. Flowers in short panicles on the old wood. Petals 5-12, bright yellow, fragrant, $1\frac{1}{2}$ in. in diameter. Filaments short. Fruit of 3-6 drupes, oblong-ovoid, black, surrounded by the calyx, $\frac{1}{4}$ in. long. Flowers in April and May.

In the jungle at Avadi. Occasionally planted in gardens Agri-horticultural Society's Garden.

Meliaceae

Trees. Leaves alternate, pinnately compound. Two halves of leaflets unequal. Flowers in panicles. Sepals or calyx-lobes 3-6. Petals same in number as sepals. Stamens 4-12, united into a tube by their filaments. Ovary 2- to 8-celled, usually on a fleshy disk. Seeds few or many.

- | | | |
|---|---|--------------------------------|
| 1 | Ovules 2 in each cell | 2 |
| | Ovules numerous | <i>Swietenia</i> (cultivated). |
| 2 | Ovary 5- to 8-celled; fruit 5- to 8-seeded | <i>Melia</i> (cultivated). |
| | Ovary 3-celled; fruit with a single seed | <i>Azadirachta</i> . |

Swietenia Mahagoni, Linn. The Mahagony Tree

This is a native of Central America and the West Indies and is occasionally cultivated here as an avenue tree. The timber is very valuable. Some good specimens grow in the Museum compound.

Melia Azedarach, Linn. The Persian Lilac

மலைவெம்பு

சூரச் சே

A small tree having lilac-coloured sweet-scented flowers. A native of the Sub-Himalayan regions and Persia. Occasionally cultivated in Madras gardens.

Azadirachta, A. Juss

Calyx-lobes and petals 5 each. Staminal tube slightly shorter than the petals, divided into 10 at the top and bearing 10 anthers. Fruit a drupe with a hard stone enclosing the seed.

Azadirachta indica, A. Juss. (*Melia Azadirachta*, Linn.) The Nim or Margosa Tree

வேப்பமரம்

Pl. VII, B.

சேச்சு

A large tree. Leaflets 9-16, lanceolate, two halves very unequal, margins toothed, glabrous, shiny above, 1-3 in. long. Flowers in panicles in the axils of leaves, white, scented. Fruit oblong, smooth, fleshy, yellow, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. The leaves are shed and replaced during February and March. Flowers appear in April immediately after the fresh leaves.

A very common shade tree, both wild and cultivated. The seeds yield an oil used in medicine. The flowers are used for culinary purposes. The bark and leaves are used in medicine. The timber is valuable. The leaves are sacred to the Goddess Mariamma.

Olacaceae

Trees or shrubs. Leaves alternate, entire. Flowers small. Petals 5 or 6. Stamens as many as and opposite to, or twice as many as, the petals, sometimes with staminodes alternating with them. Ovary 1- to 5-celled. Ovules 1-3 in each cell. Fruit a 1-seeded drupe.

Olax, Linn.

Flowers in racemes or panicles in the axils of leaves. Petals 3, meeting by their edges, two deeply divided into 2 divisions, the third not. Stamens 3, opposite to the petals. Staminodes 6. Ovary usually 3-celled. Ovules 3. Fruit a drupe covered by the enlarged calyx, 1-celled, 1-seeded.

Olax scandens, Roxb.

A thorny rambling shrub. Leaves elliptic or elliptic-oblong, glabrous, 2-3½ in. long. Flowers white, scented, arranged in racemes in the axils of leaves. Fruit round, ¾ in. in diameter, all but the apex enclosed by the enlarged calyx. Flowers August to March.

Jungle near Avadi. Not common.

Opiliaceae.

Trees, or erect or climbing shrubs. Leaves alternate, entire. Flowers small, in spikes or racemes in the axils of leaves. Calyx small or minute, obscurely 4- or 5-lobed. Petals 4 or 5. Fleshy glands present between the petals. Stamens as many as the petals and opposite to them. Ovary 1-celled. Ovules 1. Fruit a drupe.

Opilia, Roxb.

Climbing shrubs or small trees. Flowers small, 1-3 together in the axils of deciduous bracts. Calyx minute. Petals 5, meeting by their edges. Style very short.

Opilia amentacea, Roxb.

A scrambling shrub with pale brown branches. Leaves lanceolate, leathery, glabrous, 2-4 in. long. Flowers crowded into racemes 1-1½ in. long. Flowers ½ in. long. Drupe oblong, greenish.

Jungle at Vandalur. Rather scarce. This species is not mentioned by Mr. Fischer in his Forest Flora of East Central Madras.

Celastraceae

Trees or shrubs, sometimes thorny. Leaves simple. Flowers small. Sepals and petals 4-5 each, imbricate in bud. Stamens as many as petals and alternating with them, inserted on the margin of a disk which fills the bottom of the calyx. Ovary 2- to 5-celled. Fruit a capsule or a drupe.

Gymnosporia, Wt. & Arn.

Shrubs or small trees, thorny. Leaves alternate. Flowers in branched cymes, sometimes on the thorny branches. Ovary 2- or 3-celled. Stigmas 3. Ovules 2 in each cell. Fruit a capsule.

Gymnosporia emarginata, Lawson

Pl. VII, C.

A shrub armed with long straight thorns, the latter bearing leaves and flowers. Leaves obovate, tough, slightly notched at apex, glabrous, 1-2 in. long. Flowers in clusters in the axils of leaves, white. Capsule splitting into 3 pieces. Flowers in November and December.

In dry forests as at Avadi and Vandalur.

Rhamnaceae

Shrubs or small trees, sometimes thorny. Flowers small, greenish, bisexual or unisexual. Sepals and petals 4 or 5 each. Stamens as many as the petals and opposite to them and inserted with them on the edge of the fleshy disk which lines the short tube of the calyx. Fruit a drupe or capsule, sometimes winged.

1	Fruit winged (the style is enlarged into a linear-oblong wing)	...	...	...	...	...	...	...	Ventilago.
	Fruit not winged	...	...	...	...	...	...	...	2
2	Fruit a capsule	...	...	...	...	...	...	...	Colubrina.
	Fruit a drupe or berry-like	...	...	...	...	...	...	...	3
3	Fruit a dry or fleshy drupe	...	...	...	...	...	...	...	Zizyphus.
	Fruit berry-like	...	...	...	...	...	...	...	Scutia.

Ventilago, Gaertn.

Climbing shrubs. Leaves alternate. Flowers in panicles in the axils of leaves and at the ends of branches. Sepals and petals 5 each. Ovary sunk in the disk, 2-celled. Ovules 1 in each cell. Fruit a 1-seeded nut attached to the style which has developed into a leathery wing.

Ventilago maderaspatana, Gaertn.

வேம்புரட்டம்

పెట్టితీక

A large climbing shrub. Leaves oblong, lanceolate or elliptic-ovate, glabrous, shiny above, 2-4 in. long. Flowers greenish-white, smell unpleasant. Fruit rounded, $\frac{1}{3}$ in. in diameter; wing $1\frac{1}{2}$ -2 in. long. Flowers January to March.

Vandalur Hills. The bark of the root is used as a dye-stuff and in medicine.

Colubrina, Rich.

Erect shrubs. Petals 5, stalked. Ovary sunk in the fleshy disk, 3-celled. Style 3-branched. Ovules 1 in each cell. Fruit a capsule.

Colubrina asiatica, Brongn.

A much-branched shrub. Leaves ovate, crenate-serrate, glabrous, $1\frac{1}{2}$ -2 in. long. Flowers yellowish, in short axillary cymes. Capsule quite smooth, globose, $\frac{3}{8}$ in. in diameter. Fruit ripening in December.

Adyar, on the banks of the river.

Zizyphus, Juss.

Trees or shrubs, usually armed with thorns (modified stipules). Leaves 3- to 5-ribbed. Flowers in clusters or in cymes in the axils. Ovary 2- to 4-celled. Styles 2 or 3. Fruit a drupe with a 1- to 4-celled stone, one seed in each cell.

1	Styles 3	...	...	...	...	...	...	...	Xylopyrus.
	Styles 2	...	...	...	...	...	...	...	2
2	A small tree	...	...	...	...	...	...	...	Jujuba.
	A climber	...	...	...	...	...	...	...	Oenoplia.

Zizyphus Xylopyrus, Willd.

கொட்டாங்கச்சி கீழ்க்

A small tree or a straggling shrub. Leaves roundish or oblong, serrate, 3-nerved, unequal-sided at base, glabrous above, coated with soft yellowish hair below, $1\frac{2}{3}$ -3 in. long. Flowers in small dense clusters in the axils. Fruit round, woody, softly hairy, about 1 in. in diameter. Flowers June to September.

Avadi. Guindy Park. Vandalur.

Zizyphus Jujuba, Juss. The Jujube Tree

இலந்தை Pl. VII, D. ௧௭

A small thorny tree. Leaves ovate-elliptic, 2-nerved, glabrous above, softly hairy beneath, $1-2\frac{1}{2}$ in. long. Flowers in small clusters in the axils; greenish-yellow. Fruit yellow or orange, edible, $\frac{1}{2}$ in. in diameter. Flowers in October and November. Fruit ripens in December and January. Common in scrub jungle and in hedges.

Zizyphus Oenoplia, Mill.

A large, very thorny, straggling or climbing shrub. Leaves ovate-lanceolate, 3-nerved, margin finely toothed, two halves unequal, densely silky below, $1-1\frac{1}{2}$ in. long. Flowers in small clusters in the axils. Fruit a globose, black, edible drupe, $\frac{1}{4}$ in. in diameter. Flowers April to November.

Common in hedges and in scrub jungle.

Scutia, Commers.

Glabrous shrubs. Leaves opposite or nearly so, tough. Ovary sunk in the disk, 2- to 4-celled. Fruit dry or somewhat fleshy, girt at the base by the persisting calyx-tube.

Scutia myrtina, Kurz (*Scutia indica*, Brongn.)

A straggling thorny shrub. Leaves elliptic, obovate or circular, shiny above, $\frac{3}{4}$ -1½ in. long. Flowers in small clusters in the axils of leaves, white. Fruit globose, smooth, white, $\frac{1}{4}$ in. in diameter. Flowers February to March.

Vandalur Hills.

Vitaceae

Climbers having tendrils. Tendrils and inflorescences opposite to the leaves. Leaves alternate, palmately veined or compound. Flowers small, greenish. Calyx small, truncate or 4- or 5-toothed. Petals 4 or 5, falling off rather early. Stamens as many as the petals and opposite to them. Berry 2- to 4-celled, with 1 or 2 seeds in each cell.

1 Petals 4	2
Petals 5	<i>Vitis</i> (cultivated).
2 Berry 1-seeded .. .	<i>Cissus</i> .
Berry 2- to 4-seeded	<i>Cayratia</i>

Vitis vinifera, Linn. The Grape

திராட்சை

பழம்

Occasionally cultivated in Madras. Some years ago almost every house in Mylapore had a grape vine trained on a pandal specially erected for the purpose. Its cultivation in Madras is now becoming rare.

Cissus, Linn. (*Vitis*, Linn.)

Leaves usually simple, rarely compound and having 3 leaflets. Flowers in cymes that look like umbels. Calyx cup-shaped. Petals 4. Ovary 2-celled, with 2 ovules in each cell. Fruit 1-seeded.

1 Leaves compound having 3 leaflets	<i>setosa</i> .
Leaves simple	2
2 Stems with four acute angles	<i>quadrangaris</i> .
Stems not angular	3
3 Leaves obscurely 3- to 5-lobed; tendrils not branched	<i>vitigena</i> .
Leaves not lobed; tendrils forked	<i>repens</i> .

Cissus setosa, Roxb. (*Vitis setosa*, Wall.)

A prostrate succulent herb covered with bristly hairs. Tendrils long, forked. Leaflets fleshy, obovate-oblong, irregularly toothed, glabrous above, hairy on the nerves beneath, 2-3 in. long. Flowers arranged in branching cymes. Calyx cup-shaped. Berry scarlet, covered with bristles. Flowers in August and September. Fruit ripens in November.

In scrub jungle. Avadi and Vandalur.

Cissus quadrangularis, Linn. (*Vitis quadrangularis*, Wall.)

பிரண்டை Pl. VIII, B. செடி

A rambling and climbing shrub. Stem fleshy, 4-angled, constricted at the joints, old parts leafless. Tendrils not branched. Leaves broadly ovate, serrate, cordate at base, glabrous, 1-2 in. long. Flowers in umbel-like cymes, red. Berry $\frac{1}{4}$ in. in diameter, red when ripe. Flowers at most parts of the year.

Very common in scrub jungle where it climbs over bushes and small trees. The young stems are used for culinary purposes.

Cissus vitiginea, Linn. (*Vitis Linnaei*, Wall.)

A climbing or trailing herb. Tendrils stout, unbranched. Leaves roundish-ovate, shallowly or deeply 3- to 5-lobed, irregularly toothed, softly hairy beneath, 2-5 in. long. Flowers in branched cymes. Berry blue, $\frac{3}{8}$ in. in diameter. Flowers in December.

Very common in scrub jungle. Guindy Park. Vandalur.

Cissus repens, Lamk. (*Vitis repens*, Wt. & Arn.)

A slender trailing herb. Stem glabrous. Tendrils forked. Leaves broadly ovate, bluntly acuminate at apex, cordate at base, margins very finely toothed, thin, glabrous, 3-6 in. long. Flowers in branching umbel-like cymes. Flowers very small. Berry $\frac{1}{2}$ in. in diameter. Flowers in October.

Adyar, near to the Theosophical Society's Gardens. Kodambakkam Road.

The occurrence of this species on the East Coast is noteworthy as the distribution given for this plant in Gamble's Flora of the Presidency of Madras is "West Coast and Western Ghats."

Cayratia, Juss.

Leaves palmately divided or having 3 leaflets. Calyx cup-shaped. Petals 4. Ovary 2-celled with 2 ovules in each cell. Fruit a 2- to 4-seeded berry, usually woody.

Leaves having 3 leaflets carnosa.

Leaves having 7-11 leaflets, the side ones palmately divided. pedata.

Cayratia carnos, Gagnep (*Vitis carnos*, Wall.)

A rather fleshy shrub. Leaflets ovate, serrate, the two halves of the lateral ones unequal, almost glabrous, 1-2 in. long. Leaf-stalk 1-2 in. long. Tendrils wiry, usually branched. Flowers in umbel-like cymes. Petals 4, white. Disk round the ovary conspicuous. Fruit 2- to 4-seeded, black. Seeds triangular in cross-section. Flowers in November and December.

In waste places.

Cayratia pedata, Juss. (*Vitis pedata*, Vahl)

Pl. VIII, C.

A large but weak climber. Stem rather hairy. Tendrils long, slender, forked. Leaflets 7-11, the lowest two on each side close together, oblong-lanceolate, serrate, acuminate, the two halves not equal, under surface softly hairy, upper surface sparsely hairy, 2-5 in. long. Leaf-stalks 2-3 in. long. Flowers in corymb-like cymes. Calyx shallow, 4-lobed. Petals 4, white. Berry 2- to 4-seeded, of the size of a pea, cream-coloured when ripe. Fruit ripens in November.

In waste land near Mylapore and at Adyar.

Sapindaceae

Trees or shrubs, rarely herbaceous climbers. Leaves alternate, usually compound. Flowers bisexual or unisexual. Sepals alike or sometimes unlike. Petals 4 or 5, alike or unlike, sometimes absent. Stamens usually 8. Ovary usually 3-celled. Ovules 1 in each cell. Fruit a capsule or a fleshy or tough drupe.

1 Climbing herbs	...	...	...	...	...	...	Cardiospermum.
Erect shrubs or trees	...	...	...	...	...	...	2
2 Petals absent; leaves simple; fruit winged	...	...	...	...	...	...	Dodonaea.
Petals present; leaves compound	...	...	...	...	...	...	3
3 Leaves with an odd unpaired leaflet at its end	...	...	...	...	...	...	Allophylus.
Leaves without an odd leaflet at its end	...	...	...	...	...	...	4
4 Sepals unequal; petals unequal; fruit not lobed	...	...	...	...	...	...	Lepisanthes.
Sepals equal; petals equal; fruit lobed	...	...	...	...	...	...	Sapindus
							(planted).

Cardiospermum, Linn.

Climbing herbs having tendrils. Leaves bipinnate. Leaflets 9. Sepals and petals 4 each, in unequal pairs. Style 3-branched. Fruit a 3-cornered capsule.

Cardiospermum Halicacabum, Linn.

முடக்கற்றான் Pl. VIII, D. மஞ்சள்காய்

Branches slender. Leaflets deeply cut into segments, acuminate, glabrous, $\frac{1}{2}$ -1 in. long. Flowers small, white, in few-flowered umbel-like cymes. Peduncles bearing 2 tendrils arranged oppositely. Capsule bladder-like, truncate at top, winged along the three edges. Seeds black with a large white heart-shaped spot. Flowers October to January.

In waste places and in jungle. Used in medicine.

Dodonaea, Linn.

Shrubs. Leaves simple: Flowers inconspicuous, unisexual or bisexual. Sepals 2-5. Petals absent. Stamens 8. Undeveloped pistil present in male flowers. Ovary 3- to 6-celled. Ovules 2 in each cell. Capsule winged.

Dodonaea viscosa, Linn.

விராவி Pl. VIII, E. மந்தார

A stiff shrub. Leaves oblanceolate, narrowed at the base, glabrous, shiny, $1\frac{1}{2}$ in. long. Flowers in racemes or panicles at ends of branches, greenish-yellow. Fruit thin, winged, yellowish-brown, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Flowers October to December.

Very common. Guindy Park. Avadi. Vandalur.

Allophylus, Linn.

Shrubs or small trees. Leaves compound or simple. Flowers small, in spikes in the axils of leaves. Sepals and petals 4 each. Ovary 2-celled. Ovules 1 in each cell. Fruit a drupe.

Allophylus serratus, Radlk. (*Allophylus* Cobbe, Blume)

A shrub. Leaflets 3, ovate or elliptic, serrate, acute, softly hairy beneath, 2-5 in. long. Flowers white, in spikes shorter than the leaves in length. Fruit of the size of a pea, red when ripe. Flowers in October and November.

Avadi.

Lepisanthes, Blume (*Hemigyrosa*, Blume)

Trees or shrubs. Leaves compound, paripinnate. Leaflets entire. Flowers unisexual or bisexual, in racemes or panicles. Sepals 5, imbricate, the 2 outer smaller. Petals 4, sometimes a small fifth petal present. Fruit 3-celled, 3-sided, tough, with 1 seed in each cell.

Lepisanthes tetraphylla, Radlk. (*Hemigyrosa canescens*. Thw.)

A moderate-sized, crooked tree. Leaflets 4 or 6, oblong, glabrous, shiny, 3-5 in. long. Flowers small, white. Fruit yellow, velvety outside, $\frac{1}{4}$ -1 in. in diameter. Flowers in March and April.

On hills at Pallavaram and Vandalur.

Sapindus emarginatus, Vahl (*Sapindus trifolius*, Hiern) The Soap-nut Tree

நரைப்பிஞ்சு

கஞ்சு

A fair-sized tree. Leaflets 4-6, oblong, 2-6 in. long. Flowers small, white, in panicles. Fruit a drupe.

A native of the hills of the Eastern Ghats and parts of the Western Ghats, occasionally grown in Madras compounds.

Filicium decipiens, Thw.

A handsome tree having elegant fern-like leaves with winged rachis. A native of the Western Ghats. Sometimes cultivated as an ornamental tree. Two specimens are growing in the Museum compound.

Schleichera trijuga, Willd. The Lac Tree

பூவம்

A fair-sized tree. Leaves in 2 or 3 pairs, large, oblong, bright red when young. Flowers in racemes, small, whitish, appearing with the leaves about April. A native of the hill-forests of the Presidency and occasionally found in Madras compounds.

Museum compound.

Anacardiaceae

Trees or shrubs usually with acrid or resinous juice. Leaves alternate, simple or compound. Flowers small, 1-sexual or 2-sexual. Sepals 3-5. Petals 3-5. Stamens as many as the petals or twice as many. Ovary with 2-6 carpels. Fruit a drupe.

- | | | | | | | | |
|---|--|-----|-----|-----|-----|-----|-------------|
| 1 | Leaves pinnately compound | ... | ... | ... | ... | ... | Odina. |
| | Leaves simple | ... | ... | ... | ... | ... | 2 |
| 2 | Stamens not more than 5, only 1 or 2 developed | ... | ... | ... | ... | ... | Mangifera. |
| | Stamens 8-10, all or almost all perfect | ... | ... | ... | ... | ... | 3 |
| 3 | Fruit a small fleshy drupe; ovary of 5 or 6 free carpels, only | | | | | | |
| | 1 developing | ... | ... | ... | ... | ... | Buchanania. |
| | Fruit a kidney-shaped nut carried by a large fleshy pedicel; | | | | | | |
| | ovary 1-celled | ... | ... | ... | ... | ... | Anacardium. |

Odina, Roxb.

Deciduous trees with stout soft branches. Leaves pinnately compound. Leaflets opposite, entire. Flowers 1-sexual, arranged in panicles. Calyx 4-lobed. Petals 4, overlapping in bud. Stamens 8 in male flowers. Ovary 1-celled and having 4 styles in the female flowers. Male flowers having a rudimentary ovary and female ones having a few sterile stamens. Fruit a fleshy drupe.

Odina Wodier, Roxb. The Indian Ash Tree

ஒடியமரம் Pl. VIII, A. ఒడిహను

A moderate-sized deciduous tree. Bark thick, smooth, grey. Leaves having 7-11 leaflets. Leaflets ovate-oblong, glabrous, shiny, 3-6 in. long. Flowers in racemes at the ends of branches, yellowish. Fruit a small, red, ovoid drupe. Flowers in March and April when the tree stands bare of leaves.

Hills at Vandalur. Frequently planted in avenues.

Mangifera, Linn.

Trees. Leaves alternate, leathery, simple, entire. Flowers small, arranged in panicles at the ends of branches, unisexual flowers growing with bisexual ones. Calyx with 4 or 5 sepals, soon falling. Petals 4 or 5, overlapping. Stamens 1-5, only 1 or 2 fertile. Ovary 1-celled, oblique. Style placed slantingly at the top of the ovary. Fruit a large fleshy drupe.

Mangifera indica, Linn. The Mango

மாமரம் మామిడి చెట్టు

A large spreading evergreen tree. Leaves oblong or oblong-lanceolate, glabrous, shiny, aromatic when crushed, 5-10 in. long. Flowers in panicles at the ends of branches, yellowish-white with a faint smell. Stamens single. Anthers purple. Flowers January to March.

Widely cultivated. Improved by grafting. It is wild on the Eastern and Western Ghats and is frequently self-sown on the plains.

Buchanania, Spreng.

Trees. Leaves alternate, simple. Flowers small, white, in branched panicles. Calyx short, 3- to 5-toothed, remaining on fruit. Petals 4 or 5, overlapping each other. Stamens 8-10. Ovary of 5-6 carpels, only 1 fertile. Ovules single. Fruit a small drupe.

Buchanania Lanza, Spreng. (Buchanania latifolia, Roxb.)

காட்டுமாமரம் సాఠ

A medium-sized tree. Leaves oblong, leathery, glabrous, 5-10 in. long. Flowers in panicles in the axils of leaves and at the ends of branches, small, greenish-white. Stamens 10. Drupe black, oblique, $\frac{1}{3}$ - $\frac{1}{2}$ in. in diameter. Flowers September to February.

Vandalur Hills. The seeds are nutritious and palatable when roasted and are used as a substitute for almonds.

Anacardium, Rottb.

Shrubs or trees. Leaves alternate, simple, leathery, quite entire. Flowers unisexual together with bisexual ones, arranged in the same panicles at the ends of branches. Sepals and petals 5 each. Stamens 8-10. Ovary obovoid. Ovules 1. Fruit kidney-shaped, on a fleshy body which is the enlarged top of the flower-stalk.

Anacardium occidentale, Linn. The Cashew-nut Tree

முந்திரி

మాంశమూడి

A moderate-sized tree. Leaves obovate or elliptic, leathery, glabrous, aromatic when crushed, 4-6 in. long. Flowers in panicles at the ends of branches, brown to pink. Fruit a curved nut about 1 in. long, on the greatly enlarged fleshy flower-stalk which becomes red and juicy. Flowers October to February.

A native of Tropical America cultivated and naturalized in India. Very common on the seashore. Ennur. Elliot's Beach. The seeds are roasted and eaten.

Moringaceae

Trees with soft white wood. Leaves alternate, twice or thrice pinnately compound. Stipules absent. Flowers arranged in panicles in the axils of leaves. Calyx cup-shaped, 5-cleft, the segments unequal, imbricate, same colour as petals. Petals 5, unequal, the 2 upper small, the lowest largest. Perfect stamens 5, opposite to the petals with 5-7 sterile anther-less ones. Anthers 1-celled. Ovary 1-celled. Ovules arranged along 3 vertical lines on the walls of the ovary. Fruit an elongate, 1-celled, beaked capsule splitting along 3 lines on drying. Seeds many, usually winged, buried in the substance adherent to the walls of the ovary.

Moringa, Lamk.

Characters the same as those of the family.

Moringa oleifera, Lamk. (*Moringa pterygosperma*, Gaertn.)

முருங்கை

The Drum-stick or Horse-radish Tree

మనఁ

A weak-stemmed tree with corky grey bark and soft white wood. Leaves tripinnately compound, up to 1½ ft. long. The lateral leaflets elliptic, the end ones obovate, slightly larger than the lateral ones, ½-¾ in. long. Flowers white, in large panicles. Pods white, 9-ribbed, 1½ ft. long. Seeds triangular in cross-section, 3-winged.

Wild in Northern India and extensively cultivated for its immature pods which are used for curries. The leaves and flowers are also eaten as vegetables. The scraped root is used as a substitute for horse-radish. Several parts of the tree are used in Indian medicine. An oil called Ben oil, valued as a lubricant for fine machinery, is extracted from the seeds. The large branches planted in the ground root freely and soon become small trees.

Leguminosae

Leaves alternate, stipulate, simple or compound, their bases often thickened. Petals alike or unlike. Stamens usually 10, rarely fewer, sometimes many, variously arranged. Ovary single-celled. Fruit usually a pod opening along both edges.

Key to the Sub-Families

- 1 The uppermost petal largest, standing outermost and enclosing the two lower pairs in the bud; stamens usually joined together Papilionatae.
 Petals not arranged as above; stamens free 2
- 2 Petals over-lapping each other in the bud; flowers large, clustered in racemes or panicles Caesalpinioideae.
 Petals inconspicuous, meeting by their edges; flowers arranged in heads or spikes Mimosoideae.

Papilionatae

Herbs, shrubs or trees. Leaves simple or compound. Calyx of 5 sepals, more or less united. Corolla of 5 unequal petals; the uppermost, the standard, larger than the others and enclosing them in the bud; the two lateral ones, the wings, unsymmetrical and exterior to the two lowest, which are more or less joined together forming the keel which encloses the stamens and pistil. Stamens 10, all united or 9 united into a tube which is cleft on the upper side, the tenth or uppermost one separate. Ovary 1-celled, or 2- to many-celled by transverse partitions.

- 1 Pods jointed if more than 1-seeded or appearing to be jointed. 2
 Pods not jointed 8
- 2 Stamens united into one group 3
 Stamens united into a group of 9 and one remaining separate, or into two groups of 5 each 4
- 3 Pods barbed Zornia, p. 76.
 Pods not barbed but wrinkled Stylosanthes, p. 76.
- 4 Leaflets without stipels 5
 Leaflets having stipels 6
- 5 Water-plants with many leaflets Aeschynomene, p. 77.
 Land-plants with few leaflets Ormocarpum, p. 77.
- 6 Pod appearing from the outside to be divided transversely but not actually so Pseudarthria, p. 78.
 Pod actually divided 7

7	Sections of pod thick	...	...	...	...	...	Alysicarpus, p. 78.
	Sections of pod flattened	...	...	...	...	...	Desmodium, p. 79.
8	Fruit having a single seed	...	...	...	...	9	
	Fruit having more than 1 seed. (In <i>Indigofera linifolia</i> and <i>Indigofera echinata</i> there is only one seed in the fruit)	...	...	...	...	13	
9	Herbaceous plants	...	...	...	...	10	
	Shrubs or trees	...	...	...	...	12	
10	Erect plants	...	...	...	...	11	
	Trailing plants	...	...	...	...	...	Eleiotis, p. 80.
11	Leaves dotted with oil glands	...	...	...	...	...	Psoralea, p. 80.
	Leaves not dotted with oil glands	...	...	...	...	...	Mellilotus, p. 81.
12	Pods winged; climbing shrubs	...	...	...	...	...	Derris, p. 81.
	Pods not winged; erect trees	...	...	...	...	...	Pongamia, p. 82.
13	Stamens in one group	...	...	...	...	14	
	Stamens in a group of 9 and one separate	...	...	...	...	19	
14	Leaves simple or palmately compound	...	...	...	...	15	
	Leaves pinnately compound	...	...	...	...	17	
15	Anthers equal; keel petals not joined	...	...	...	...	...	Rothia, p. 82.
	Anthers unequal; keel petals joined	...	...	...	...	16	
16	Pods flattened; flowers standing singly in the axils	...	...	...	...	...	Heylandia, p. 82.
	Pods thick; flowers in racemes	...	...	...	...	...	Crotalaria, p. 83.
17	Leaves having an even number of leaflets	...	...	...	...	...	Abrus, p. 84.
	Leaves having 3 leaflets	...	...	...	...	18	
18	Flowers very small	...	...	...	...	...	Teramnus, p. 85.
	Flowers large and showy	...	...	...	...	...	Canavalia, p. 85.
19	Leaves having 2 leaflets	...	...	...	...	...	Lathyrus, p. 85.
	Leaves having 3 or more leaflets	...	...	...	...	20	
20	Leaves having 3 leaflets	...	...	...	...	21	
	Leaves with more than 3 leaflets. (<i>Indigofera trita</i> has 3 leaflets for each leaf but can be easily recognised by its 4-angled downward-pointing fruit. <i>Indigofera linifolia</i> has simple leaves which can be recognized by their silvery surface and the pod having a single seed. Also <i>Indigofera echinata</i> has simple leaves and can be easily distinguished by its spiny fruit)	...	...	...	...	26	
21	Trees	...	...	...	...	...	22
	Herbaceous plants	...	...	...	...	...	23

- | | | | | | | | |
|----|---|-----|-----|-----|-----|-----|----------------------------|
| 22 | Stems armed with prickles | ... | ... | ... | ... | ... | Erythrina, p. 86. |
| | Stems not armed with prickles | ... | ... | ... | ... | ... | Butea, p. 86. |
| 23 | Leaflets toothed | ... | ... | ... | ... | ... | Medicago, p. 87. |
| | Leaflets entire (lobed in <i>Phaseolus trilobus</i>) | ... | ... | ... | ... | ... | 24 |
| 24 | Fruit having 2 seeds | ... | ... | ... | ... | ... | Rhyncosia, p. 87. |
| | Fruit having more than 2 seeds | ... | ... | ... | ... | ... | 25 |
| 25 | Stigma resting to one side of the style | ... | ... | ... | ... | ... | <i>Phaseolus</i> , p. 88. |
| | Stigma erect on the style | ... | ... | ... | ... | ... | <i>Dolichos</i> , p. 89. |
| 26 | Climbers | ... | ... | ... | ... | ... | <i>Clitoria</i> , p. 90. |
| | Non-climbers | ... | ... | ... | ... | ... | 27 |
| 27 | Wing petals slightly adherent to keel petals; leaves imparipinnate | ... | ... | ... | ... | ... | 28 |
| | Wing petals quite free from the keel petals, curved, oblong; leaves paripinnate | ... | ... | ... | ... | ... | <i>Sesbania</i> , p. 90. |
| 28 | Keel petals erect, with a downward-pointing spur on each side near the base | ... | ... | ... | ... | ... | <i>Indigofera</i> , p. 91. |
| | Keel petals curved inwards, not spurred | ... | ... | ... | ... | ... | <i>Tephrosia</i> , p. 93. |

Zornia, Gmel.

Herbs. Leaves compound, having 2 leaflets, dotted with oil glands. Flower enclosed in a pair of bracts that resemble the leaves. Pods consisting of 1-seeded segments that separate from one another on ripening, covered with spines.

Zornia diphylla, Pers.

A low spreading herb. Leaflets lanceolate, glabrous, dotted with black oil glands beneath, up to 1 in. long. Bracts enclosing the flowers and also the pods. Flowers yellow, small, few together. Pods 1- to 6-jointed, covered with short spines. Flowers September to January.

A very common weed.

Stylosanthes, Swartz

Rigid shrubby herbs. Leaves having 3 leaflets. Flowers small, in dense spikes or heads. Stamens united into one group. Ovules 2 or 3. Pods hooked at the apex, concealed among the upper leaves.

Stylosanthes mucronata, Willd.

A stiff woody-stemmed herb. Stipules scaly, adherent to the petioles for half their lengths. Leaflets 3, elliptic-oblong, with a sharp point at apex, glabrous above, silky and dotted with oil glands below. Flowers yellow. Pods small, concealed by the bracts.

In dry open situations.

Aeschynomene, Linn.

Erect herbaceous water-plants. Leaves with several pairs of small leaflets, sometimes sensitive to touch. Calyx 2-lipped; the upper lip 2-cleft, the lower 3-cleft. Standard roundish; keel boat-shaped. Stamens in two sets of 5 each. Pod flattened, composed of several easily separable segments.

Stems woody, slender; calyx glabrous; segments of pod
less than $\frac{1}{6}$ in. in diameter, smooth indica.

Stems pith-like; calyx covered with hairs; segments of pod
 $\frac{2}{5}$ in. long and having minute prickles on them aspera.

Aeschynomene indica, Linn.

சிவசிலக

A much-branched annual herb. Leaflets minute, numerous. Raceme 1- to 4-flowered. Corolla yellow, $\frac{3}{8}$ in. long. Pods nearly straight, 1-1 $\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad. Flowers October to December.

In wet places such as paddy fields and borders of ponds.

Aeschynomene aspera, Linn.

ஆற்றுநெட்டி. சிலக பிண்டி மூக்கு.

A tall shrubby plant with pith-like stems, lower ones floating on the water and upper ones erect. Branches few. Leaflets minute, numerous. Racemes 2- to 4-flowered. Corolla $\frac{3}{4}$ in. long. Pods 3 in. long, indented on the lower side. Flowers in the rainy weather.

In ponds and at the borders of tanks. Not so common as the last species.

The soft spongy pith-like stems, known as "Sola" pith, are used for making hats, fishing floats, etc.

Ormocarpum, Beauv.

Shrubs. Leaves compound. Petals clawed. Stamens at first in one group, later dividing into two bundles of 5 each. Pod laterally contracted, covered with prickles, the segments oblong, narrow at both ends.

Ormocarpum sennoides, DC.

A low shrub. Small branches sticky. Leaflets 7-13, oblong. Flowers yellow, in short racemes. Pods with 2-4 joints, densely covered with prickles, 1 in. long. Flowers in November and December.

Avadi.

Pseudarthria, Wt. & Arn.

Herbaceous plants. Leaves compound, having 3 leaflets. Flowers small, in pairs or in clusters on a slender axis. Stamens in a group of 9 and one separate. Pod flat, not jointed.

Pseudarthria viscida, Wt. & Arn.

A sticky shrubby herb spreading on the ground. Leaflets ovate-rhomboid, hairy, the terminal one larger than the two lateral ones, the two halves of the latter unequal, the former $1\frac{3}{4}$ - $3\frac{1}{2}$ in. long. Flowers small, in clusters on the axis of a raceme. Pod covered with sticky hairs, $\frac{7}{8}$ in. long. Flowers November to January.

Adyar. Vandalur Hills.

Alysicarpus, Neck.

Herbs. Leaves with a single leaflet as a rule. Stipules scaly. Flowers small, in racemes or spikes at the ends of branches. Bracts scale-like. Calyx chaffy, deeply 4-cleft. Stamens in a group of 9 and one separate. Pod of several 1-seeded segments which do not break open.

- | | | | | | | | | | |
|---|--|-----|-----|-----|-----|-----|-----|-----|-----------------|
| 1 | Calyx shorter or not much longer than the first segment of the pod | ... | ... | ... | ... | ... | ... | ... | 2 |
| | Calyx much longer than the first segment of the pod | ... | ... | ... | ... | ... | ... | ... | 4 |
| 2 | Pods with well-marked constrictions at the joints | ... | ... | ... | ... | ... | ... | ... | monilifer. |
| | Pods without constrictions at the joints | ... | ... | ... | ... | ... | ... | ... | 3 |
| 3 | Segments of pods swollen, square in cross-section, not hairy ; stems not hairy | ... | ... | ... | ... | ... | ... | ... | vaginalis. |
| | Segments of pods flattened, hairy ; stems with long bristly hairs | ... | ... | ... | ... | ... | ... | ... | hamosus. |
| 4 | Pods much constricted at the joints ; segments of pods prominently and closely ribbed transversely | ... | ... | ... | ... | ... | ... | ... | rugosus. |
| | Pods very slightly constricted at the joints ; segments of pods not transversely ribbed, smooth | ... | ... | ... | ... | ... | ... | ... | bupleurifolius. |

Alysicarpus monilifer, DC.

A small prostrate much-branched perennial herb. Stem with rather short bristly hairs. Leaflet variable in shape, linear-oblong or lanceolate to orbicular, usually cordate at base, rounded and having sharp points at apex, $\frac{1}{2}$ -1 in. long. Flowers in 4- to 10-flowered racemes, pink. Pod $\frac{1}{2}$ -1 in. long. Appearing during the rains.

A fairly common weed in grassy places.

Alysicarpus vaginalis, DC.

A somewhat erect much-branched herb. Leaflet variable in shape from linear-oblong to lanceolate-orbicular. Flowers in 6- to 12-flowered racemes. Corolla small, pinkish. Pods $\frac{1}{2}$ - $\frac{3}{4}$ in. long; joints 4-8. Appears during the rainy weather.

Common in grassy places and fallow fields.

Alysicarpus hamosus, Edgw.

A slender spreading very hairy herb. Stem 6-30 in. long. Leaflet circular, with a small sharp point at apex, more or less hairy on both surfaces, $\frac{1}{2}$ - $1\frac{1}{4}$ in. long. Flowers in pairs along the axis in 4- to 8-flowered racemes. Pods $\frac{1}{2}$ - $\frac{3}{4}$ in. long; segments 3-7, the end one carrying a sharp point at its apex. Flowers in October and November.

Tondiarpet. Not so common as the last two species.

Alysicarpus rugosus, DC.

Two varieties of this species are met with in Madras.

Var: *Heyneanus*, Baker

Stem up to 3-4 ft. high. Leaflet large, obovate-oblong, obtuse, covered with soft hairs underneath. Racemes 4-6 in. long. Flowers in November.

Met with rather rarely. Tondiarpet.

Var. *styracifolius*, Baker

A small plant. Stem spreading about 1 foot. Leaflet small, elliptic-oblong, obtuse at apex, hairy beneath. Flowers in short dense racemes, on a hairy axis. Appearing in the rainy weather.

In grassy places. Museum compound.

Alysicarpus bupleurifolius, DC.

Stem slender, somewhat erect. Leaflet very narrow, linear or linear-oblong, with acute apex, glabrous, $\frac{3}{4}$ - $2\frac{1}{2}$ in. long. Flowers in pairs on the axis. Corolla red. Pod up to $\frac{1}{2}$ in. long, with a sharp and pointed apex. Flowers in November and December.

Ennur, in the scrub jungle.

Desmodium, Desv.

Herbs or shrubs with compound leaves having 3 leaflets (sometimes only one). Stipules and bracts scale-like. Calyx 2-lipped. Wing-petals slightly adherent to the keel petals. Stamens 9 and 1 or sometimes in one group. Pods flat, separating into 1-seeded segments.

1 Leaflet single gangeticum.

Leaflets 3 2

2 An erect shrub; stamens in one group biarticulatum.

A wiry herb spreading and rooting at the nodes; stamens

9 and 1 triflorum.

Desmodium gangeticum, DC.

Pl. IX, E. కోలాపావన్న

An erect shrubby herb reaching 3-4 ft. Leaflets ovate or ovate-lanceolate, acute at apex, hairy beneath, glabrous above, 3-5 in. long. Flowers in copious racemes 6-12 in. long. Corolla lilac. Pod slightly curved, much indented on the lower and slightly indented on the upper edge, about $\frac{3}{4}$ in. long. Segments 6-8, sparsely clothed with minute hairs. Flowers September to December.

A very common weed. Museum compound. It is much used in Indian medicine.

Desmodium biarticulatum, Benth.

A slender shrub up to 2 ft. high. Leaves small, leathery, oblanceolate-oblong, obtuse at apex, $\frac{1}{2}$ in. long. Racemes 3-6 in. long. Bracts chaffy. Flowers red. Pod consisting of two segments, both edges indented. Flowers in September and October.

In the jungle at Avadi.

Desmodium triflorum, DC.

A very small herb spreading and rooting at the nodes. Leaflets thin, obovate, tapering towards the stalk, the terminal one slightly larger than the lateral ones, slightly notched at the apex, $\frac{1}{4}$ in. long. Flowers in dense axillary racemes. Corolla pink. Pods indented on the lower edge, $\frac{3}{4}$ in. long. Segments 5-8. Flowers November to February.

A very common weed.

Eleiotis, DC.

Slender herbs spreading on the ground. Leaves with 1-3 leaflets. Stamens 9 and 1. Ovary 1- or 2-ovuled. Pods single-seeded, membranous, boat-shaped.

Eleiotis sororia, DC.

A long trailing plant. Leaflets single, broader than long, with cordate bases, about $\frac{1}{2}$ in. long. Sometimes a pair of smaller leaflets is present at the base of the leaf-stalk above the true stipules. Flowers very small, yellow, in racemes in the axils of leaves. Pods small. Flowers October to December.

In dry situations. Adyar.

Psoralea, Linn.

Herbs. Leaves simple (or compound), sprinkled with glandular dots or points. Stamens 9 and 1. Ovary with one ovule. Pod ovoid or oblong, 1-seeded.

Psoralea corylifolia, Linn.

கார்ப்போகரிசெடி வாஸகல

An erect annual 1-3 ft. high. Leaves broadly elliptic, margins cut into teeth, rounded and having a sharp point at the apex, sprinkled with black oil-glands, $1\frac{1}{2}$ -3 in. long. Flowers in dense racemes. Corolla bluish-purple. Pod ovoid-oblong, black, having a sharp point at apex, glabrous, $\frac{1}{5}$ in. long. Flowers October to March.

A weed of waste places. The seeds are used medicinally.

Melilotus, Juss.

Herbs. Leaflets 3. Flowers small, in spike-like racemes. Petals soon falling. Pods ovoid, wrinkled, 1- or 2-seeded.

Melilotus indica, All. (*Melilotus parviflora* Desf.)

A herb about a foot high. Leaflets obovate, gradually narrowing towards the base, toothed above the middle, slightly notched or sometimes truncate at the apex, about $\frac{1}{2}$ in. long. Corolla minute, yellow. Pod tapering at both ends, 1-seeded. Flowers in January and February.

A not very common weed of cultivated places. Near Poonamallee.

Derris, Lour.

Climbing shrubs. Leaves imparipinnate. Flowers clustered in racemes. Stamens united into one group. Pod usually thin, partially winged.

Leaflets 1-2 in. long; pods less than $\frac{1}{2}$ in. broad scandens.

Leaflets $2\frac{1}{2}$ -4 in. long; pods $\frac{3}{4}$ -1 in. broad uliginosa.

Derris scandens, Benth.

சலதீக

A large climbing shrub. Branches drooping. Leaflets 9 or more, the lowest pair the smallest, elliptic-oblong, shiny above, with a slight notch at the apex. Flowers numerous, in elongate racemes in the axils of leaves. Corolla white or pale pink or mauve, $\frac{3}{8}$ in. long. Pods partially winged along the upper edge, tapering at both ends, 1-3 in. long. Flowers in July and August, all plants in the same neighbourhood flowering on the same day.

In open jungly places. Common at Adyar. Sometimes grown in gardens.

Derris uliginosa, Benth.

A large evergreen climbing shrub. Leaflets 3-7, ovate-oblong, glabrous. Racemes 3-6 in. long. Corolla $\frac{1}{3}$ in. long, rose-coloured. Pod 1-seeded, narrowly winged on the upper edge, pale yellow when ripe, $1\frac{1}{2}$ in. long, ripening in February. Flowers in the rainy months.

On the banks of the Adyar near the sea.

Pongamia, Vent.

Trees. Leaflets without stipels. Racemes borne in the axils of leaves. Standard roundish. Wings obliquely oblong, slightly adhering to the keel. Keel petals adhering at the tip. Ovules 2. Pods 1-seeded, woody, obliquely oblong, flattened, not breaking open.

Pongamia glabra, Vent.

புள்கு கஸக

A moderate-sized tree. Leaflets 5, ovate, glabrous, 3-7 in. long. Flowers white or pink. Corolla $\frac{1}{2}$ in. long. Pods $1\frac{1}{2}$ -2 in. long. Flowers in March and April.

A common tree native to this region. The seeds yield an oil which is used as a burning oil and as a remedy for skin diseases and rheumatism.

Rothia, Pers.

Annuals. Leaves palmately compound, with 3 leaflets. Flowers small. Stamens united into one group. Pods slender, many-seeded.

Rothia trifoliata, Pers.

A much-branched prostrate herb. Leaflets oblong-lanceolate, clothed with silky hairs, nearly $\frac{1}{2}$ in. long. Flowers single or 2-4 together on very short stalks. Petals yellow. Pods 2 in. long, flattened, narrowly linear, covered with silky hairs, style remaining as a point. Flowers October to January.

A very common weed on waste land.

Heylandia, DC.

Prostrate herbs. Leaves simple. Flowers small, standing singly in the axils. Stamens united into one group. Ovules 2. Pod 1- or 2-seeded.

Heylandia latebrosa, DC.

A prostrate much-branched herb with many wiry branches. Leaves numerous, two halves somewhat unequal, ovate, hairy, about $\frac{1}{4}$ in. long. Flowers in the axils of most of the leaves, almost without stalk. Corolla yellow. Pod $\frac{1}{6}$ in. long, covered with silky hairs, tipped by the persisting style. Flowers October to March.

A very familiar weed of waste land and dry hills. Pallavaram.

Crotalaria, Linn.

Herbs or shrubby herbs. Leaves simple or compound, with 3-7 leaflets. Flowers often large and showy. Stamens united into one group. Pod inflated and somewhat cylindrical, with many seeds.

1	Leaves simple	2
	Leaves compound	4
2	A prostrate trailing herb; racemes few-flowered	prostrata.
	An erect plant; racemes many-flowered	3
3	Flowers blue and white; stipules large	verrucosa.
	Flowers yellow; stipules minute	retusa.
4	Leaves palmately compound and having 5 leaflets	quinquefolia.
	Leaves pinnately compound and having 3 leaflets	5
5	Pods many-seeded, carried on stalks about 1 in. long... ..	laburnifolia.
	Pods 2-seeded, without stalks	6
6	A trailing herb	medicaginea.
	An erect herb	trifolium.

Crotalaria prostrata, Roxb.

A trailing annual. Branches many. Leaves oblong-obovate, not stalked, hairy, nearly 1 in. long. Stipules absent. Flowers small. Corolla yellow. Pods about $\frac{1}{2}$ in. long, glabrous. Flowers December to February.

In grassy places.

Crotalaria verrucosa, Linn.

ಕೃಷ್ಣಾ

A branched herb. Leaves ovate-rhomboid, tapering to the base, nerves prominent, 2-4 in. long. Stipules large, semi-circular in shape. Racemes 6-8 in. long. Corolla blue, $\frac{3}{4}$ in. long. Pods oblong-cylindrical, stalked, 1-1 $\frac{1}{2}$ in. long. Flowers throughout the year except during May and June.

A very common weed.

Crotalaria retusa, Linn.

Pl. IX, A.

A shrubby herb 2-4 ft. high. Leaves oblanceolate-oblong, rounded or with a slight notch at the apex, narrowed towards the base, 1 $\frac{1}{2}$ -3 in. long. Flowers numerous, large and showy. Corolla yellow with a purple tint, about 1 in. long. Pods stalked, linear-oblong, slightly broader at the upper end, 1-1 $\frac{1}{2}$ in. long. Flowers during the rains and after.

A common weed.

Crotalaria quinquefolia, Linn.

An erect annual 1-3 ft. high. Stems and branches furrowed. Leaflets 5, linear-elliptic, glabrous above, hairy below, 1-4 in. long. Corolla yellow, 1 in. long. Pods oblong, glabrous, 1½-2 in. long. Flowers November to January.

In wet rice fields.

Crotalaria laburnifolia, Linn.

An erect shrub 2-4 ft. high. Branches slender, glabrous. Leaflets elliptic-oblong, 1-1¾ in. long; the end one slightly larger than the two lateral ones. Flowers in elongate, few-flowered racemes. Corolla yellow, 1 in. long. Pods cylindrical, 1½-2 in. long, on long stalks. Flowers in November and December.

A very pretty garden weed. Abundant in Government House compound.

Crotalaria medicaginea, Lamk., var. *herniarioides*.

A branching prostrate herb. Branches long. Leaflets 3, broad, notched at the apex, narrowing towards the base, ¼ in. long. Racemes at the ends of branches, 8-flowered. Corolla yellow, ¼ in. long. Pods round, ⅙ in. in diameter. Flowers in November and December.

In sandy places near Adyar.

Crotalaria trifolium, Willd.

An erect herb 2-3 ft. high. Leaflets 3, obovate, with a slight notch at the apex, about 1 in. long. Racemes 6-10 in. long, many-flowered. Corolla less than ¾ in. long, yellow, the keel petals spotted with purple. Pods round, ⅔ in. in diameter. Flowers in December.

In dry places especially along railway lines. Perambur.

Abrus, Linn.

Climbing shrubs. Leaves compound, with an even number of leaflets. Flowers small, in dense racemes. Stamens 9, united in a tube split along the upper side. Ovules many.

Abrus precatorius, Linn. Indian Liquorice

சூன்றிமணி

கல்லா

A perennial twiner. Leaves 2-4 in. long. Leaflets 10-20 pairs, oblong, with a minute point at apex, up to ¾ in. long. Flowers crowded in many-flowered racemes. Corolla pink, ⅓ in. long. Pods 1-1½ in. long, with a sharp beak. Seeds 3-5, bright scarlet with a black patch, shiny. Flowers October to December.

In hedges and among bushes. The seeds are used as jeweller's weights and are said to be poisonous. The root is used in Indian medicine.

Teramnus, Sw.

Slender twining herbs. Leaflets 3. Flowers very small. Stamens united into one group of 10. Anthers alternately perfect and sterile. Ovary many-ovuled. Pods linear, ending in a hook formed by the persistent style.

Teramnus labialis, Spreng.

Leaflets oblong-lanceolate, thin, up to 1 in. long. Flowers in few-flowered racemes. Corolla reddish, minute. Pod linear, $1\frac{1}{3}$ -2 in. long. Flowers in October and November. In hedges and thickets.

Canavalia, DC.

Climbing or prostrate herbs. Leaflets 3. Flowers showy. Stamens united into one group of 10. Ovary having many ovules. Pod large.

1	Pods 6-12 in. long, $1-1\frac{1}{3}$ in. broad; seeds 8-12	...	...	ensiformis
				(cultivated).
	Pods 4-6 in. long, $\frac{1}{3}$ -1 in. broad; seeds 4-6	...	...	2
2	A climbing herb; racemes many-flowered	...	...	virosa.
	A prostrate herb; racemes few-flowered	..	...	lineata.

Canavalia ensiformis, DC. The Sword Bean

தம்பட்டை சீரவ

Occasionally cultivated in gardens for its unripe pods which are used as a vegetable.

Canavalia virosa, Wt. & Arn.

A large climber. Leaflets obovate-oblong, glabrous, about 3 in. long. Corolla lilac, about $\frac{3}{4}$ in. long. Pods 2-4 in. long. Seeds 4-6. Flowers October to January. In jungles and thickets.

Canavalia lineata, DC. (Canavalia obtusifolia, Baker)

Pl. IX, B.

A trailing plant rooting at the nodes. Leaflets broadly ovate, obovate or circular in outline, 2-3 in. long. Flowers in 4- to 8-flowered racemes, the latter carried on long stalks. Corolla lilac, 1 in. long. Pod glabrous, 3-5 in. long. Seeds 4-6. Flowers in October and November.

One of the sand-binding plants of the Madras beach. Often found growing with Ipomaea Pes-capre.

Lathyrus, Linn.

Herbs. Leaves abruptly pinnate, ending in a tendril or bristle. Stipules leaf-like. Stamens 9 and 1. Style bearded on one side. Pods many-seeded.

Lathyrus sativus, Linn. Chikling Vetch

A branched annual. Stems winged. Leaves ending in a 3-branched tendril. Leaflets 2, linear, having a foetid smell when crushed, 1-2 in. long. Petiole winged. Stipules broad. Flowers standing singly. Calyx up to $\frac{1}{2}$ in. long. Corolla blue, $\frac{3}{4}$ in. long. Pods glabrous, winged on the back, 4- or 5-seeded, $1\frac{1}{2}$ in. long. Flowers in January.

A casual weed. Indigenous to Bengal and further north.

Erythrina, Linn.

Trees. Stems often studded with prickles. Leaves compound, with 3 leaflets. Flowers large and showy. Stamens 10, one standing free. Pods curved, swollen, contracted between the seeds.

Erythrina indica, Lamk. The Coral Tree

கலியாணமுருங்கை வாடீர்

A moderate-sized tree. Prickles dark-coloured, conical. Leaflets broadly rhomboid-ovate, 4-6 in. long. Flowers appearing before the leaves in dense racemes. Corolla bright scarlet, wing- and keel-petals nearly equal, $2-2\frac{1}{2}$ in. long. Pods almost cylindrical, constricted between the seeds, 5-12 in. long. Seeds brownish-red, kidney-shaped, hard, $\frac{1}{2}$ in. long. Flowers in February and March.

Both wild and cultivated. The tree stands bare of leaves in February when the flowers appear.

Butea, Roxb.

Trees or shrubs. Leaflets 3, large. Flowers large and showy, many together in a raceme. Calyx broadly cup-shaped. Standard recurved, equal to or shorter than the keel. Wings curved, adherent to the incurved keel. Stamens 9 and 1. Ovary 2-ovuled. Pod an oblong follicle, base flat and wing-like, splitting at the top.

Butea frondosa, Koen. The Flame of the Forest

பலாசமரம் மொடீர்

A moderate-sized tree. Leaflets leathery in texture, broadly obovate, the side ones smaller, their two halves unequal, glabrous above, finely hairy below, 4-6 in. long. Flowers appearing after the leaves have fallen, $1\frac{1}{2}$ -2 in. long. Calyx velvety green. Corolla orange-scarlet. Fruit a flattened pod with a single seed at the apex, the remainder forming a wing, 5-8 in. long. Flowers in February and March.

Vandalur Hills and neighbourhood. Occasionally planted in gardens in the city. The tree yields a gum, known as Butea Kino which has astringent properties. The flowers yield a brilliant but unstable yellow dye. The bark yields a strong fibre.

The tree is considered very sacred by the Hindus, the flowers being used in worship, the dried twigs for feeding the sacred fire, the stems as staffs by brahmacharis and the leaves as spoons for pouring ghee into the sacrificial fire. The timber is not of much value.

Medicago, Linn.

Herbs Leaflets 3-toothed. Stipules often divided. Stamens 9 and 1. Pod spirally twisted.

Medicago denticulata, Willd.

A small annual herb. Leaflets obovate, narrowed towards the base, slightly toothed, apex slightly depressed and with a sharp point, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Flowers 2-6 together. Pods of 2-4 turns, with spiny margins. Flowers in the rainy weather.

A native of South Europe. It is occasionally found as a weed in cultivated land.

Rhyncosia, Lour.

Trailing, twining or erect herbs. Leaflets 3. Flowers yellow, arranged in racemes or clusters. Standard furnished with a pair of ear-like appendages at the base. Stamens 9 and 1. Pods flat, 1- or 2-seeded.

- | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|----------|
| 1 | A climbing herb; branches sticky | ... | ... | ... | ... | ... | viscosa. |
| | Trailing herbs | ... | ... | ... | ... | ... | 2 |
| 2 | Calyx $\frac{1}{2}$ in. long; seeds having an appendage at the scar | ... | ... | ... | ... | ... | aurea. |
| | Calyx $\frac{1}{6}$ in. long; seeds without any appendage at the scar | ... | ... | ... | ... | ... | minima. |

Rhyncosia viscosa, DC.

A climber. Stem covered with sticky hairs. Leaflets finely dotted with oil-glands, broadly deltoid, sharply acuminate, $1\frac{1}{2}$ -3 in. long. Racemes 2-4 in. long. Corolla about $\frac{1}{2}$ in. long. Pod narrowed at both ends, $1\frac{1}{4}$ in. long. Flowers in July and August.

Adyar, in jungly places.

Rhyncosia aurea, DC.

A slender trailing annual herb. Leaflets rhomboid-obovate, the lateral ones with their two halves unequal, scantily hairy on both surfaces, $\frac{1}{2}$ - $1\frac{1}{2}$ in. long. Racemes 6- to 20-flowered. Calyx $\frac{1}{2}$ in. long; teeth 3-4 times as long as the tube. Corolla a little longer than the calyx. Standard with 2 hard lumps at the base. Pods roundish, transversely marked with fine lines, with a sharp point at apex. Flowers December to March.

A not very common weed.

Rhyncosia minima, DC.

A slender trailing annual. Stems numerous, much-branched. Leaflets as broad as long, rhomboid-obovate, glabrous above, slightly hairy on the veins beneath, base wedge-shaped, under-surface dotted with oil glands, $\frac{3}{8}$ -1 in. long. Racemes 6- to 12-flowered. Calyx up to $\frac{1}{6}$ in. long; teeth twice as long as the tube. Corolla yellow. Pod slightly recurved, about $\frac{1}{2}$ in. long. Flowers November to January.

A very common weed along railway lines.

Phaseolus, Linn.

Herbs, twining, prostrate or rarely erect. Leaflets 3. Keel petals prolonged into a spiral beak. Stamens 9 and 1. Pod almost divided into 1-seeded cells. Seeds smooth.

An erect herb; leaflets entire; flowers purplish-red	...	...	semierectus.
A trailing herb; leaflets 3-lobed; flowers yellow	...	...	trilobus.

Phaseolus semierectus, Linn.

An erect herbaceous annual, 2-3 ft. high. Leaflets oblong-lanceolate, acute, base wedge-shaped, glabrous on both surfaces, $1\frac{1}{2}$ - $2\frac{3}{4}$ in. long. Flowers in spike-like racemes up to 6 in. long. Peduncles up to 1 ft. long. Corolla purple, $\frac{1}{2}$ in. long. Pods very narrow, cylindrical, sharply beaked, 3-4 in. long. Seeds many, rectangular. Flowers in the rainy weather.

A very conspicuous weed in paddy fields. It is a native of Central and South America that has become naturalized here.

Phaseolus trilobus, Ait.

பிழிபெரு

A trailing herb. Stems hairy. Leaflets 3-lobed, as broad as long, glabrous, ovate-oblong, $1\frac{1}{2}$ -1 in. long. Flowers in few-flowered racemes, crowded at the top of the peduncle. Peduncles 4-9 in. long. Corolla yellow, $\frac{1}{4}$ in. long. Pods straight, 1-2 in. long. Flowers October to March.

A very common weed of grassy places and edges of cultivated fields.

Phaseolus radiatus, Linn. Black Gram

உளுந்து

மிளகாயு

Occasionally cultivated in Madras.

Phaseolus Mungo, Linn. Green Gram

பச்சைப்பயறு

பெரு

Also occasionally cultivated in this region.

Dolichos, Linn.

Twining or prostrate herbs. Leaflets 3. Calyx bell-shaped, with deltoid teeth, the upper pair united. Standard circular in outline, with a pair of appendages at the base. Stamens 9 and 1. Pod flat. Seeds thick.

- | | | | | | | |
|---|---|-----|-----|-----|-----|-----------|
| 1 | Flowers lilac or pink | ... | ... | ... | ... | 2 |
| | Flowers yellow | ... | ... | ... | ... | ciliatus. |
| 2 | Racemes and peduncles each 6 in. long or more; leaflets 2-4 in. long; style bearded along the inner edge | ... | ... | ... | ... | Lablab. |
| | Racemes and peduncles each under 2 in. long; leaflets under 2 in. long; style not bearded along the inner edge... | ... | ... | ... | ... | falcatus. |

Dolichos ciliatus, Klein

A slender twiner. Leaflets oblong, entire, glabrous, fringed with hairs on the edges, 1-3 in. long. Flowers 3-6, arranged in a cymose cluster. Corolla yellow, $\frac{1}{2}$ in. long. Pod 1-1 $\frac{1}{2}$ in. long. Flowers November to January.

Theosophical Society's Gardens, Adyar.

Dolichos Lablab, Linn.

அவரை பிசுபு

A twining herb. Leaflets deltoid-ovate, nearly as broad as long, entire, acute, glabrous, 2 in. long or more. Peduncles about 6 in. long. Flowers pink, $\frac{3}{8}$ in. long. Pod 1 $\frac{1}{2}$ in. long, the base of the style persisting at the tip. Flowers in December and January.

Growing wild in hedges on the Kodambakam Road. The cultivated form of this species differs from the wild one in the size of the leaves, flowers and pods which are larger. There are two varieties, pink- and white-flowered. The immature pods are cooked and eaten in curries.

Dolichos falcatus, Klein

A very slender twiner with wiry stems. Leaflets entire, deltoid-ovate, acute or obtuse, glabrous, 1-2 in. long. Peduncles 1-2 in. long, bearing 2-8 flowers. Corolla lilac, about $\frac{1}{3}$ in. long. Pod 2-3 in. long. Flowers in November and December.

In hedges.

Dolichos biflorus, Linn. Horse Gram

கொள்ளு கௌன்

Cultivated and also found run wild near Madras.

Clitoria, Linn.

Twining herbs. Leaflets 3-many. Flowers large. Standard much larger than the rest of the flower, erect, rounded, notched at the tip; keel small, shorter than the wings, incurved, acute. Pods linear-oblong, flattened, several-seeded.

Clitoria Ternatea, Linn.

காக்கட்டான் Pl. IX, C. கம்புமுட்டி தந்தை

A very pretty climber. Leaflets 5-7, elliptic-oblong, obtuse at apex, 1-2 in. long. Flowers standing singly in the axils. Corolla deep blue or white, 1½-2 in. long. Pods 2-4 in. long, sharply beaked. Flowers September to January.

In hedges. Both the blue- and the white-flowered varieties are common. The root is used in medicine.

Sesbania, Scop.

Herbs, shrubs or small soft-wooded trees, sometimes prickly. Leaves pinnately compound with an even number of leaflets. Flowers in racemes in the axils of leaves. Calyx bell-shaped, with 5 equal teeth. Stamens 9 and 1. Pod long, partitioned between the seeds.

- | | | |
|---|-----|--------------|
| 1 Stem without prickles; standard with two appendages | ... | aegyptiaca. |
| Stem prickly; standard without appendages | ... | 2 |
| 2 Flowers ½ in. long; pod straight, 8-12 in. long, slightly constricted between the seeds | ... | aculeata. |
| Flowers 3 in. long; pods curved, 1 ft. long, not constricted between the seeds | ... | grandiflora. |

Sesbania aegyptiaca, Pers.

கருஞ்செம்பை நீமிங்க

A soft-wooded shrub. Leaves 2-4 in. long. Leaflets 20-30, linear-oblong, pale green, glabrous, ½-1 in. long. Flowers usually in 6- to 10-flowered racemes, sometimes fewer. Corolla yellow or reddish-yellow, ½-¾ in. long. Standard marked with purple on the outside. Pods twisted, slightly constricted between the seeds, 6-9 in. long. Flowers in October and November.

Cultivated in gardens and also found run wild. The leaves and seeds are used in medicine.

Sesbania aculeata, Poir.

A prickly shrub attaining 8 ft. in height. Stems somewhat woody. Leaves up to 1 foot in length. Leaflets small, 20-50 pairs, oblong, with a sharp point at the apex. Flowers in drooping 3- to 6-flowered racemes. Corolla pale yellow with red dots on the

back of the standard, $\frac{1}{2}$ in. long. Pod slightly curved, 6-9 in. long. Flowers in November and December.

In wet places. Common in the marshes at Ennur.

Sesbania grandiflora, Pers.

அகத்தி மல்ல

A soft-wooded tree up to 20-30 ft. in height. Leaves $\frac{1}{2}$ -1 ft. long. Leaflets linear-oblong, glabrous. Flowers large, white or red, 2-3 in. long. Pods curved, about 1 foot long. Flowers in February and March.

Planted in betel gardens. The leaves are used for curries.

Indigofera, Linn.

Herbs or shrubs. Leaves pinnately compound, sometimes simple. Flowers very small, reddish or purple, in racemes or spikes. Standard ovate or roundish. Wings oblong, lightly adherent to the keel. Keel petals erect, with a downward pointing spur on each side near the base. Stamens 9 and 1. Ovary 1-, 2- or many-ovuled.

- | | | | | | | |
|---|--|-----|-----|-----|-----|---------------|
| 1 | Pods 1-seeded, globose; leaves simple | ... | ... | ... | ... | linifolia. |
| | Pods 2- to many-seeded; leaves compound | ... | ... | ... | ... | 2 |
| 2 | Flowers standing singly in the axils; leaflets usually 3 | ... | ... | ... | ... | aspathoides. |
| | Flowers in heads or racemes | ... | ... | ... | ... | 3 |
| 3 | Flowers in heads; pods 2-seeded; leaflets 7-9 | ... | ... | ... | ... | enneaphylla. |
| | Flowers in racemes | ... | ... | ... | ... | 4 |
| 4 | Leaflets alternate | ... | ... | ... | ... | oblongifolia. |
| | Leaflets opposite | ... | ... | ... | ... | 5 |
| 5 | Leaflets 3 | ... | ... | ... | ... | trita. |
| | Leaflets 5 or more | ... | ... | ... | ... | 6 |
| 6 | Stems and pods covered with sticky hairs | ... | ... | ... | ... | viscosa. |
| | Stems and pods not covered with sticky hairs | ... | ... | ... | ... | 7 |
| 7 | Stems and pods densely covered with soft spreading hairs | ... | ... | ... | ... | hirsuta. |
| | Pods quite glabrous; stems glabrous or very slightly hairy | ... | ... | ... | ... | 8 |
| 8 | Leaflets 5, stems quite glabrous | ... | ... | ... | ... | glabra. |
| | Leaflets 7-11; stems slightly covered with silvery hairs | ... | ... | ... | ... | tinctoria. |

Indigofera linifolia, Retz.

A much-branched annual herb. Stems covered with silvery hairs. Leaves linear, acute at both ends, with a sharp point at apex, silvery-white on both surfaces, $\frac{1}{2}$ -1 in. long. Racemes 6-1 to 2-flowered. Corolla bright red. Pods globose, silvery-white. Seeds single. Flowers in February and March.

Vandalur.

Indigofera aspalthoides, Vahl

சிவஞர்வேம்பு

An erect stiff shrubby herb. Leaflets usually 3, sometimes 5, not stalked, crowded on the young branches, linear, up to $\frac{1}{4}$ in. long. Flowers standing singly in the axils. Corolla red. Fruit $\frac{5}{8}$ in. long. Flowers in October and November.

Abundant on the sand dunes at Ennur.

Indigofera enneaphylla, Linn.

A much-branched prostrate herb with a stout underground axis. Leaflets 7-9, almost stalkless, oblanceolate, narrowed at base, very small. Flowers small, in 10- to 20-flowered heads, bright red. Pods cylindrical, $\frac{1}{6}$ in. long. Seeds 2. Flowers October to March.

A very common weed in grassy places, road sides, etc.

Indigofera oblongifolia, Forsk.

A rigid erect shrub attaining 6 ft. in height. Young branches and leaves covered with silvery hairs. Leaflets 3-5, sometimes single, elliptic-oblong, $\frac{5}{8}$ -1 in. long. Flowers small in 20- to 50-flowered racemes. Corolla red. Pods slightly curved back, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Flowers in January and February.

In waste places.

Indigofera trita, Linn.

A stiff shrubby herb up to 3 ft. high. Leaflets 3, obovate-oblong, clothed with silvery hairs, $\frac{1}{2}$ - $\frac{7}{8}$ in. long, the end one much larger. Flowers small, 6-12 in a raceme, salmon-pink. Pods rigid, spine-pointed, 4-angled, hairy, downward-pointing, up to 1 in. long. Flowers in October and November.

A weed of waste places.

Indigofera viscosa, Lamk.

An erect annual 1-3 ft. high. Branches clothed with sticky hairs. Leaflets 7-13, elliptic-obovate, more hairy beneath, up to $\frac{3}{8}$ in. long. Flowers in 6- to 12-flowered racemes. Corolla pink. Pods $\frac{3}{4}$ -1 in. long, clothed with gland-tipped hairs. Flowers November to January.

In sandy places near the sea.

Indigofera hirsuta, Linn.

An erect herb densely covered with soft hairs. Leaflets 5-11, elliptic-oblong or obovate, hairy on both surfaces, 1-2 in. long. Flowers in dense racemes, 2-6 in. long. Calyx densely hairy, $\frac{1}{4}$ in. long. Corolla pink. Pods pointing downwards, 4-angled, densely clothed with soft spreading hairs, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Flowers in November and December.

Common at Vandalur. Occasionally met with in the city.

Indigofera glabra, Linn.

A small herb. Leaflets 5, very small, obovate-elliptic. Flowers small, 2-4 in a raceme, red. Pods straight, spine-pointed, glabrous, $\frac{3}{4}$ -1 in. long. Flowers in December and January.

In waste places; not common.

Indigofera tinctoria, Linn. The Indigo Plant

நீலி நெ

A branching shrub reaching up to 6 ft. high. Leaflets 9-13, oblong or oblanceolate, glabrous above, slightly hairy below, $\frac{1}{2}$ -1 in. long. Flowers numerous in spicate racemes. Corolla pink. Pods linear, glabrous, $\frac{3}{4}$ -1 $\frac{1}{4}$ in. long. Flowers in the rainy weather.

Found run wild but not cultivated near Madras.

Tephrosia, Pers.

Herbs or shrubby herbs. Leaves oddly pinnate. Leaflets silvery beneath. Calyx 5-cleft. Standard roundish, usually silky outside, turned back, scarcely longer than the coherent wings and keel. Stamens 9 and 1. Pods linear, flat, several-seeded.

- | | | | | | | | |
|---|--|-----|-----|-----|-----|-----|-------------|
| 1 | Stems prostrate | ... | ... | ... | ... | ... | procumbens. |
| | Stems erect or partially erect | ... | ... | ... | ... | 2 | |
| 2 | Pods densely velvety | ... | ... | ... | ... | ... | hirta. |
| | Pods glabrous or sparsely hairy | ... | ... | ... | ... | 3 | |
| 3 | Flowers in the axils of leaves; corolla pale pink | ... | ... | ... | ... | ... | maxima. |
| | Flowers opposite the leaves; corolla bluish-purple | ... | ... | ... | ... | ... | purpurea. |

Tephrosia procumbens, Ham. (*Tephrosia purpurea*, var. *pumila*, Baker)

A slender prostrate branching herb. Leaflets 9-15, oblong-obovate, densely hairy beneath, up to $\frac{1}{3}$ in. long. Flowers in 1-, 2- or 3-flowered racemes, white. Pods 1-1 $\frac{1}{2}$ in. long. Flowers in December and January.

On open waste lands.

Tephrosia hirta, Ham. (*Tephrosia villosa*, Wt. & Arn.)

Pl. IX, D.

An erect shrubby herb clothed with silky hairs. Leaves 2-3 in. long. Leaflets 11-19, narrowly oblanceolate, narrowed at the base, slightly notched and with a sharp point at apex, glabrous above, silky beneath, about $\frac{1}{2}$ in. long. Flowers on an elongated axis. Calyx densely hairy. Corolla pale red. Pod entirely covered with dense velvety hairs, curved upwards, 1-1 $\frac{1}{2}$ in. long. Flowers in October and November.

On waste land.

Tephrosia maxima, Pers. (*Tephrosia purpurea*, var. *maxima*, Baker)

A shrubby herb.. Leaves $2\frac{1}{4}$ - $3\frac{1}{4}$ in. long. Leaflets 13-17, obovate, narrowed to the base, with a sharp point at apex, the end one $\frac{3}{4}$ -1 in. long. Racemes in the axils of leaves, many-flowered, elongated. Corolla pale pink, $\frac{1}{2}$ in. long. Pods glabrous, 2- $2\frac{1}{4}$ in. long. Flowers October to December.

In open situations.

Tephrosia purpurea, Pers.

கொள்ளுக்காய் நெய்லி

An erect shrubby herb 1-2 ft. high. Leaves 3-6 in. long. Leaflets 13-21, oblanceolate, glabrous above, obscurely silky beneath, notched at apex, $\frac{1}{4}$ - $\frac{1}{2}$ in. long. Racemes opposite the leaves, many-flowered. Corolla bluish-purple, slightly silky, slightly over $\frac{1}{4}$ in. long. Pod $1\frac{1}{2}$ in. long, more flattened than in the preceding species. Flowers at various parts of the year.

Very common on waste land, roadsides and in open forest land.

The following plants belonging to this sub-family are cultivated in or near Madras:—

Cajanus indicus, Spreng. Pigeon Pea or Dhal துவரை கம்பிசெட்டி

Arachis hypogaea, Linn. The Ground-Nut or Pea-Nut வேர்க்கடலை நெய்நெய்

A native of South America. After the flowers wither the ovary-bearing stems force themselves underground where the pods ripen.

Cicer arietinum, Linn. Bengal Gram. கடலை நெய்

Cyamopsis tetragonoloba, Taub. The Cluster-bean. கொத்தவரை நீர்மூலக்காய்

Trigonella Foeniculum-graecum, Linn. Fenugreek

வெந்தயம் நெய்நெய்

A small herb, wild in Kashmir and Punjab. Cultivated for its leaves which are eaten when cooked.

Dalbergia lanceolaria, Linn.

A moderate-sized, deciduous tree, a native of dry hill forests. It has 7-11 ovate-oblong leaflets, loose panicles of pinkish white flowers and 1- to 3-seeded pods tapering at both ends and stamens in two groups of five each. There is a tree in the Museum compound.

Caesalpinioideae

Trees or shrubs, rarely herbs. Leaves pinnately compound or twice pinnately compound, sometimes apparently simple (*Bauhinia*). Petals 5, very nearly equal except the innermost one, imbricate in bud. Sometimes, as in *Saraca*, true petals are absent the sepals being brightly coloured. Stamens 10, sometimes fewer.

- | | | | | |
|---|---|-----|-----|-----------------------------|
| 1 | Leaves apparently simple, camel-foot-shaped | ... | ... | <i>Bauhinia</i> , p. 95. |
| | Leaves compound | ... | ... | 2 |
| 2 | Leaves bipinnately compound | ... | ... | 3 |
| | Leaves simply compound | ... | ... | 7 |
| 3 | Sepals overlapping each other | ... | ... | 4 |
| | Sepals meeting by their edges | ... | ... | 6 |
| 4 | Pod winged along the edges or at apex | ... | ... | 5 |
| | Pod not winged | ... | ... | <i>Caesalpinia</i> , p. 96. |
| 5 | Pod with a firm, hard, flattened border; large thornless trees. | | | <i>Peltophorum</i> , p. 98. |
| | Pod produced to a wing at apex; thorny straggling shrubs. | | | <i>Pterolobium</i> , p. 98. |
| 6 | Flowers large; pod thin, flat; leaves with many pairs of pinnae | ... | ... | <i>Delonix</i> , p. 98. |
| | Flowers comparatively small; pod thick, jointed between the seeds; pinnae only 2-6, arising from a much-reduced axis. | | | <i>Parkinsonia</i> , p. 99. |
| 7 | Petals 5; stamens usually 10 | ... | ... | <i>Cassia</i> , p. 99. |
| | Petals 3; stamens only 3 developed | ... | ... | <i>Tamarindus</i> , p. 103. |

Bauhinia, Linn. Camel's Foot Plants

Trees or shrubs. Leaves consisting of two leaflets united into one entire leaf, more or less deeply cleft at the apex and palmately ribbed. Flowers showy. Calyx-limb entire and spathe-like or cleft into two or five teeth. Petals 5, somewhat unequal. Stamens usually 10, sometimes only 5, 3 or even 1 fertile, the rest undeveloped or absent. Ovary stalked, many-ovuled. Pods flattened, breaking open or not.

Flowers large, two together; leaflets united for about half their lengths; pods thin, breaking open ... *tomentosa*.

Flowers small, in racemes; leaflets united for two-thirds of their lengths; pods thick, sickle-shaped, not breaking open. *racemosa*.

Bauhinia tomentosa, Linn.

மந்தாரை Pl. X, B. காமச்ச

An erect shrub, younger parts downy. Leaves broader than long, lobes obtuse, with a small point between the lobes, 7-nerved, 1-2 in. long. Stalks of leaves swollen at both ends. Calyx-limb spathe-like, 6-toothed, $\frac{1}{2}$ in. long. Petals yellow, the upper one often

with a purple blotch at the base, $1\frac{3}{4}$ -2 in. long. Stamens 10. Pods covered with soft hairs and becoming perfectly hairless when ripe, 4-5 in. long. Flowers August to October.

Three different forms of this species are found in Madras. In the commonest form the purple blotch at the base of the uppermost petal is absent. This grows in hedges usually. It flowers profusely and is well-known. The flowers never open fully and become a light purple before they fall. The typical form with a purple blotch at the base of the uppermost petal is commonest in gardens. The flowers become a darker purple before they fall and do not open fully. The third form was introduced into Madras by Dr. Gravely from Guntasila, Chilka Lake. In this form the petals are a paler yellow and stand wide open. The young shoots are more strongly downy than in either of the others and the leaves are larger. The flowering season is earlier and the plants are less able to stand water-logged soil in the rains.

Bauhinia racemosa, Lamk.

பூ

A small tree. Leaves leathery, 2-lobed for about $\frac{1}{3}$ of their length, 7- to 9-nerved, white and somewhat sparsely covered with soft hairs below, $\frac{3}{4}$ -2 in. long. Flowers small, white or pale-yellow. Fruit a thick pod, often twisted and curved, 9-12 in. long. Flowers in March and April.

Scrub jungle at Avadi and Vandalur.

The following species are cultivated in Madras gardens and are well-known:—

Bauhinia acuminata, Linn.

கொக்குமந்தாரை மண்டூ

A small shrub with leaves divided less than half-way down and having pure white fragrant flowers.

Bauhinia purpurea, Linn.

சிவப்புமந்தாரை பூப்பூ

A native of deciduous forests. A small tree with fairly large, tough leaves and large, scented, deep pink flowers appearing after the rains.

Bauhinia variegata, Lamk.

In the variety cultivated in Madras gardens the flowers are large, scented and white with the innermost petal slightly variegated with purple at its base. A native of hill-forests. Flowers in February and March.

Caesalpinia, Linn.

Trees or shrubs, sometimes covered with prickles. Leaves with an even number of pinnae. Pinnae with an even number of leaflets. Flowers often showy, arranged in racemes or panicles. Petals 5, the innermost smallest. Stamens 10. Pods spiny or not.

1	Pods covered with prickles	...	...	...	...	...	2
	Pods not covered with prickles	...	...	...	...	...	3

- 2 Leaves with large leaf-like stipules; leaflets obtuse, 1-2 in. long, with a sharp point at the apex; pods 2-3½ in. long ... crista.
 Leaves without stipules; leaflets acute at apex, 2-3 in. long; pods 4-5 in. long ... Jayabo.
- 3 Pods straight; stem sparsely armed with prickles; leaflets about 10; flowers large, in corymb-like racemes; a shrub ... pulcherrima.
 Pods twisted; stem without prickles; leaflets 25-30 pairs; flowers small, in short dense panicles; a small tree ... Coriaria.

Caesalpinia crista, Linn. (*Caesalpinia Bonducella*, Flem.)

கழற்சிக்காய் Pl. X, A. கடி

A large straggling very thorny shrub. Leaves with 6-8 pairs of pinnae. Pinnae with 6-8 pairs of oblong-elliptic leaflets 1-2 in. long. Stipules large, pinnately divided. Bracts lanceolate, about ½ in. long. Flowers in large racemes, yellow, about 1 in. long. Fruit an oblong prickly pod 2-3 in. long, with 1 or 2 round grey seeds. Flowers September to November.

On the banks of the Cooum near the Island. Ennur on the sands. Adyar, on the banks of the river. The seeds are used in medicine.

Caesalpinia Jayabo, Maza (*Caesalpinia Bonduc*, Baker)

This species is very like the last, but the stipules are absent and the leaflets are a little larger.

I have not collected this species, but Mr. Fischer states that it occurs in similar situations to the previous species.

Caesalpinia pulcherrima, Swartz

A glabrous shrub beset with a few weak prickles. Leaves with 6-8 pairs of pinnae. Leaflets 8-12 pairs for each pinna, up to 7/8 in. long. Flowers yellow or scarlet, 1½ in. across. Filaments very long, bright red. Pods narrow, thin, 2-3 in. long. Flowers almost all through the year.

Very commonly cultivated in gardens. It is believed to have come from America.

Caesalpinia Coriaria, Willd. The Divi-divi

இங்கிராம் ஜிவிவி

A small tree. Leaves with 6-8 pairs of pinnae. Pinnae with many small leaflets approaching those of an *Acacia* in general appearance. Flowers small, light-yellow or green, sweet scented. Pods thick, twisted. Flowers July to December.

Planted for its pods which yield a valuable tanning material. The tree is a native of South America.

Peltophorum, Vogel

Tall trees. Leaves bipinnately compound. Flowers showy, yellow, arranged in panicles. Petals spreading. Stamens 10; filaments with a dense tuft of hairs at the base. Pod flat, thin, hard, not breaking open, with a firm broad strip on each edge.

Peltophorum ferrugineum, Benth.

A tall quick-growing tree. Young branches clothed with thin reddish-brown hairs. Leaves about 1 foot long. Pinnae 8-11 pairs. Leaflets 10-18 pairs, oblong, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Branches of the panicles numerous, covered with soft reddish-brown hairs. Flowers golden-yellow. Petals soon falling. Pod narrow at both ends, closely veined along its length, 2-4 in. long. Flowers in March and April.

This is a very common ornamental and shade tree. This is a native of Malaya. Good specimens are found in the Museum compound.

Pterolobium, R. Br.

Climbing shrubs or trees armed with thorns. Leaves bipinnate. Leaflets small. Stipules and stipels small, soon falling. Flowers in racemes, carried on long pedicels. Calyx with 5 imbricate lobes, the lowest the longest. Petals 3, unequal, with a stalk-like part. Stamens 10. Ovary 1-ovuled. Pod not breaking open, 1-seeded, winged.

Pterolobium indicum, A. Rich.

A climbing shrub, armed with recurved thorns. Leaves bipinnate. Pinnae 4-8 pairs. Leaflets 12-16 pairs to each pinna, oblong, sparsely hairy, $\frac{1}{3}$ in. long. Flowers in racemes in the axils of leaves or at ends of branches, rather small, yellow. Fruit a 1-seeded pod ending in an oblong or curved wing, reddish. Flowers May to November.

Vandalur Hills. Guindy Park, near the Tharamani Gate.

Delonix, Raf. (Poinciana, Linn.)

Trees. Leaves twice pinnate. Leaflets many, small. Flowers large, showy, in corymbs at ends of branches. Calyx-lobes nearly equal. Petals 5, circular in outline, with a narrow stalk-like base. The uppermost petal unlike the others. Stamens 10. Pod elongate, flat, woody, breaking open at maturity.

Petals cream-coloured turning orange; leaflets 5 in. long; pod

6-8 in. long, 1 in. broad elata.

Petals crimson, base yellow, the upper petal whitish streaked with red and yellow; leaflets $\frac{1}{4}$ in. long; pod up to 30 in.

long, 2 in. broad regia.

Delonix elata, Gamble. (*Poinciana elata*, Linn.)

வாத்தவாயணன் வாநாராயணன்

A medium-sized tree. Leaves about 8 in. long. Pinnae up to 8 pairs. Leaflets 10-20 pairs to each pinna, linear-oblong, $\frac{1}{3}$ in. long. Flowers in corymb-like racemes. Calyx nearly 1 in. long. Petals yellow fading to white. Stamens about 2 in. long. Pods tapering at both ends, 6-8 in. long. Flowers December to March.

Occasionally planted as an avenue tree on the sides of roads. I have not found this tree growing wild in Madras.

Delonix regia, Raf. (*Poinciana regia*, Boger) The Gold Mohur

A moderate-sized tree. Leaves nearly 2 ft. in length. Pinnae 11-18 pairs. Flowers bright scarlet, arranged in racemose clusters in the axils of leaves or at the ends of branches. Pod long, flat. The tree stands bare of leaves in the early hot weather and the flowers appear along with the young leaves during the hot season.

This tree is a native of Madagascar.

Parkinsonia, Linn.

Small thorny trees. Leaves doubly-compound with the main axis much reduced and resembling simply-compound leaves crowded together. The axes of the pinnae long and much flattened, bearing many very small leaflets. Stipules spiny. Flowers in racemes in the axils of leaves. Uppermost petal broadest. Stamens 10. Anthers similar.

Parkinsonia aculeata, Linn.

A small thorny tree or a large shrub. Leaves bipinnate, but apparently simply pinnate. Pinnae 2, with flattened axes. Leaflets numerous, very small, oblanceolate-oblong, glabrous. Flowers in racemes in the axils of leaves, lemon-yellow, about 1 in. in diameter. Fruit a linear pod constricted between the seeds, 3-4 in. long. Flowers at various parts of the year, particularly January to March.

A native of Tropical America thoroughly naturalized here. Very common along the Buckingham Canal. It is also grown as a hedge.

Cassia, Linn.

Plants with abruptly pinnate leaves. Glands often present on the leaf-stalk or between the leaflets. Flowers showy, generally yellow. Sepals 5. Petals 5, almost equal, spreading. Stamens 5-10, unequal, some of them often imperfect, spreading. Anthers opening by 2 pores or slits at the apex. Pods many-seeded, often with transverse partitions, cylindrical or not.

1 Pods cylindrical	...	...	...	...	...	...	...	2
Pods flat	...	...	...	...	...	...	...	3

- | | | | | | | |
|----|--|-----|-----|-----|------------------------|------------------------|
| 2 | Leaflets 4-8 pairs; petals yellow | ... | ... | ... | ... | Fistula. |
| | Leaflets 10-20 pairs; petals pink | ... | ... | ... | ... | marginata. |
| 3 | Fertile stamens 6-7, the rest undeveloped | ... | ... | ... | 4 | |
| | Fertile stamens 10 | ... | ... | ... | ... | glauc
(cultivated). |
| 4 | Glands present on the petiole or between the leaflets | ... | ... | ... | 5 | |
| | Glands absent | ... | ... | ... | 9 | |
| 5 | Leaves with a single gland just above the base of the petiole. | ... | ... | ... | 6 | |
| | Leaves with glands between the leaflets, none at the base
of the petiole | ... | ... | ... | 8 | |
| 6 | Leaves practically glabrous | ... | ... | ... | 7 | |
| | Leaves and pods covered with rough hairs | ... | ... | ... | hirsuta. | |
| 7 | Leaflets 3-5 pairs, ovate, acuminate | ... | ... | ... | occidentalis. | |
| | Leaflets 5-10 pairs, oblong-lanceolate, acute | ... | ... | ... | Sophera. | |
| 8 | An annual herb; leaflets 3 pairs; stipules small | ... | ... | ... | Tora. | |
| | A shrub; leaflets 8-12 pairs; stipules large | ... | ... | ... | auriculata. | |
| 9 | Pods more than 3 in. long | ... | ... | ... | 10 | |
| | Pods less than 3 in. long | ... | ... | ... | 12 | |
| 10 | Pods winged at the middle of each edge; stipules large, not
falling; flowers in racemes | ... | ... | ... | alata
(cultivated). | |
| | Pods not winged; stipules minute, soon falling; flowers
arranged in panicles | ... | ... | ... | 11 | |
| 11 | Pods 3-5 in. long, flat, edges thin; surface crossed by
straight transverse ridges when dry | ... | ... | ... | montana. | |
| | Pods 6-9 in. long, edges thickened, surface indented
between the seeds | ... | ... | ... | siamea. | |
| 12 | Leaflets few | ... | ... | ... | 13 | |
| | Leaflets many | ... | ... | ... | 14 | |
| 13 | Stem, branches and pods covered with sticky hairs; leaflets
2 pairs | ... | ... | ... | Absus. | |
| | Stem, branches and pods not covered with sticky hairs;
leaflets 4-6 pairs | ... | ... | ... | obtusa. | |
| 14 | Leaflets 20-40 pairs; stamens 5 | ... | ... | ... | pumila. | |
| | Leaflets 40-60 pairs; stamens 10 | ... | ... | ... | mimosoides. | |

Cassia Fistula, Linn. The Indian Laburnum

சரக்கொன்றை Pl. X, C. ரீல

A medium-sized tree. Leaflets 8-16, arranged oppositely, ovate, glabrous, 2-5 in. long. Flowers in long hanging racemes in the axils of leaves or at ends of branches, bright yellow, $1\frac{1}{2}$ in. in diameter. Fruit a cylindrical pod 1-2 ft. long, black when dry and remaining on the tree for a considerable time after ripening. Seeds arranged transversely. Flowers May to July.

Guindy Park. Planted in gardens. The material surrounding the seeds is used in Indian medicine.

Cassia marginata, Roxb.

செங்கொன்றை நீயுரீல

A medium-sized tree. Leaflets 10-20 pairs. Leaflets thin, oblong, two halves of leaflet unequal at base, glabrous, $\frac{3}{4}$ -2 in. long. Flowers in racemes in the axils of leaves, pink, about 1 in. in diameter. Fruit a black cylindrical pod about 1 foot long. Flowers July to October.

A common tree frequently planted in gardens.

Cassia glauca, Lamk.

காந்தசெம்பை

A handsome shrub or a small tree. Leaflets 4-6 pairs, ovate, 1-1 $\frac{1}{2}$ in. long. Flowers in fairly large clusters, pale yellow. Flowers November to January.

A native of the Western Ghats. Cultivated in gardens.

Cassia hirsuta, Linn.

A shrubby herb. Leaves covered with stiff hairs. Leaflets 2-4 pairs, lanceolate, 2-4 in. long. Flowers yellow, in corymbose clusters. Pods slender, flattened, hairy. Flowers October to December.

In waste places. This is a native of America now naturalized in South India.

Cassia occidentalis, Linn.

கரிவெட்டு

A shrubby herb. An ovoid dark red gland present at the base of the petiole. Leaflets 4 or 5 pairs, ovate-lanceolate, pointed at apex, glabrous, 1-3 in. long. Flowers in corymb-like clusters in the axils of leaves, yellow. Pods somewhat curved, 4-5 in. long, $\frac{1}{3}$ in. broad. Flowers during the rainy months.

Common near villages. This plant is believed to have come from the West Indies.

Cassia Sophera, Linn.

A shrubby herb. A conical gland present at the base of the petiole. Leaflets 5-10 pairs, oblong-lanceolate, acute or slightly tapering at apex, 1-2 in. long. Flowers in corymb-like racemes in the axils of leaves, orange-yellow. Pods slightly curved, 3-4 in. long, $\frac{3}{8}$ in. broad. Flowers in September and October.

On waste ground. Not as common as the last species which it closely resembles.

Cassia Tora, Linn.

தகரை கௌர

An annual herb up to 2 ft. long. Leaflets 3 pairs, oblong-obovate, glabrous, 1-1 $\frac{3}{4}$ in. long. A pair of glands present between each of the lowest 2 pairs of leaflets. Flowers yellow. Pods 5-8 in. long, cross-section almost square. Flowers during the rainy weather.

A very common weed of waste places and road sides.

Cassia auriculata, Linn.

ஆவாரை கௌர

A shrub. Leaves with glands between all the 8-12 pairs of leaflets. Stipules large, ear-shaped. Leaflets oblong-ovate, $\frac{3}{4}$ -1 in. long. Flowers bright yellow, fairly large, in corymb-like clusters in the axils of leaves and at ends of branches. Pod flat, brown, 3-5 in. long. Flowers during most of the year but chiefly February to July.

Common in scrub jungle at Avadi, Pallavaram and Vandalur. The bark is much valued as a tanning material. The leaves are used in medicine. In some districts the dried flowers are used as a substitute for coffee and I have known instances where the leaves also have been used for this purpose.

Cassia alata, Linn.

சீமையகத்தி நீய் அவி

A shrub. Leaflets 8-14 pairs, large. Flowers large, yellow. Pods winged, 4-8 in. long. Flowers during and after the rains.

A native of the West Indies common in gardens and occasionally found run wild. The leaves are used for curing ringworm.

Cassia montana, Heyne

A shrub. Leaflets 10-16 pairs, oblong, 1-1 $\frac{1}{2}$ in. long. Flowers in racemes in the axils of leaves and at ends of branches, yellow. Pods flat, dark brown, with a sharp point at apex, 3-5 in. long, $\frac{2}{3}$ in. broad. Flowers July to September.

Vandalur Hills.

Cassia siamea, Lamk.

கருங்கொன்றை நீயுதெரு

A fair-sized tree. Leaflets 6-12 pairs, oblong, glabrous, with a slight notch and a point at apex, $1\frac{1}{3}$ -3 in. long. Flowers in large panicles at ends of branches, yellow, about 1 in. in diameter. Pod flat, 6-9 in. long, $\frac{2}{3}$ in. broad. Flowers June to November.

One of the commonest trees in Madras. It is a native of Ceylon, Malay Peninsula and Siam and has now become thoroughly naturalized here.

Cassia Absus, Linn.

கருங்கொள்ளு சனசாலவித்துப்பெயு

A sticky herb. Leaflets 2 pairs, elliptic-oblong, two halves unequal at base, acute at apex, about 1 in. long. Flowers in few-flowered racemes, reddish-yellow. Stamens 5, all perfect and equal. Pods thin, clothed with sticky hairs, $1-1\frac{3}{4}$ in. long. Seeds 4-6, black, shiny. Flowers September to November.

On waste land. Common along railway lines near Chetpat. The seeds are used in Indian medicine in the treatment of eye-diseases.

Cassia obtusa, Roxb.

A branching herb. Leaves 4-6 pairs, obovate-oblong, obtuse at apex, glabrous, about 1 in. long. Flowers arranged in racemes in the axils of leaves, yellow. Pods much curved, $1-1\frac{1}{2}$ in. long.

I have not come across this plant within our area. I am including it on the authority of Mr. Fischer.

Cassia pumila, Lamk.

A small spreading herb. Leaflets 20-40 pairs, very small, two halves unequal, slightly hairy. Flowers standing singly, small, yellow. Pods flat, slightly curved, with oblique partitions between the seeds, covered with scattered hairs, about $1\frac{1}{2}$ in. long. Flowers in September and October.

Vandalur, on the way to the hills.

Cassia mimosoides, Linn.

A small spreading herb. Leaves nearly 2 in. long. Leaflets minute, 40-60 pairs, overlapping. Flowers standing singly in the axils of leaves, yellow. Petals about $\frac{1}{4}$ in. long. Pods flat, nearly straight, $1\frac{1}{2}$ -2 in. long. Flowers in December and January.

Guindy Park.

Tamarindus, Linn.

Trees. Leaves abruptly pinnate. Leaflets small. Flowers in racemes at ends of branches. Calyx-lobes 4. Petals 3, imbricate. Stamens 3. Pods oblong, thick, with a brittle shell, containing a pulpy acid material.

Tamarindus indica, Linn. The Tamarind

புளி -சிந்த

A large tree. Leaves 10-20 pairs. Leaflets close-set, oblong, glabrous, $\frac{1}{3}$ in. long. Flowers pink with yellow stripes. Fruit 3-8 in. long. Flowers May to July. Both wild and planted. It is believed to be indigenous to Central Africa.

Saraca indica, Linn. The Ashoka Tree of the Ramayana

அசோகம் லக்ஷ்மணம்

Leaves having 2 or 3 pairs of large oblong-lanceolate leaflets. Flowers brilliant scarlet, arranged in large clusters. Flowers in February and March.

A native of the Western Ghats and hills of Ganjām and Vizagapatam. Occasionally planted in gardens.

Museum compound. Agri-Horticultural Society's Garden.

Mimosoideae.

Plants with pinnately or twice pinnately compound leaves. Flowers small, in heads or spikes. Sepals and petals usually 5 each, valvate, more or less united below or quite free. Stamens few or many. Pods breaking open or not, sometimes jointed.

1	Stamens few	...	...	...	...	...	...	2
	Stamens many	...	...	...	...	...	...	9
2	Flowers in heads	...	...	...	...	...	...	3
	Flowers in long spikes	...	...	...	...	...	...	7
3	Lower flowers of spike neuter, their stamens being sterile and pistil absent or sterile						Neptunia, p. 105.	
	All flowers perfect	...	...	...	...	...	...	4
4	Pods curved, transversely jointed and breaking along the joints						Mimosa, p. 106.	
	Pods straight, continuous and breaking along the edges	...	...	...	...	...	...	5
5	Stamens united by their filaments into a tube; calyx-teeth imbricate						Parkia (cultivated), p. 106.	
	Stamens free; calyx-teeth valvate	...	...	...	...	...	...	6
6	Pinnae 6-8; leaflets 30-40						Desmanthus, p. 106	
	Pinnae 8-16; leaflets 20-30	...	...	...	...	...	Leucaena, p. 107.	
7	Trees not armed with thorns; seeds red						Adenanthera (cul- tivated), p. 107.	
	Trees or shrubs armed with thorns; seeds not red	...	...	...	...	...	...	8

- | | | |
|----|---|------------------------------------|
| 8 | All flowers perfect | Prosopis, p. 107. |
| | Lower flowers neuter, their stamens being reduced to staminodes and pistil absent or sterile | Dichrostachys, p. 108. |
| 9 | Stamens free | Acacia, p. 108. |
| | Stamens united together by their filaments into a tubular column | 10 |
| 10 | Pods divided by partitions between the seeds | Enterolobium (cultivated), p. 109. |
| | Pods not divided by partitions between the seeds | 11 |
| 11 | Pods thick, curved | Pithecolobium, p. 110. |
| | Pods thin, straight | Albizzia, p. 110. |

Neptunia, Lour.

Erect, prostrate or floating herbs. Leaves twice pinnate. Leaflets many, small, sensitive. Flowers collected in heads in the axils of leaves; upper flowers bisexual, middle ones male, lower ones neuter with flattened undeveloped stamens. Calyx small, 5-toothed. Petals 5, valvate. Stamens in bisexual and male flowers 10. Ovary stalked, many-ovuled. Pods flat, thin.

A floating water-plant having no gland on the rachis of leaves oleracea.

A land-plant with a gland between the lowest pair of pinnae triquetra.

Neptunia oleracea, Lour.

Pl. X, D.

An annual water-plant having spongy floats on the stem and fibrous roots at the nodes. Pinnae 2 or 3 pairs. Leaflets 8-15 pairs. Flowers in cylindrical heads $\frac{1}{2}$ - $\frac{3}{4}$ in. long, lower flowers replaced by yellow undeveloped stamens. Stamens 10. Pods stalked, curved backwards, depressed between the seeds, $\frac{1}{2}$ -1 in. long. Flowers December to February.

Common in ponds.

Neptunia triquetra, Benth.

A low prostrate land-plant. Pinnae 2 or 3 pairs. Leaflets 10-15 pairs. Flowers yellow, in round heads, sterile flowers absent or few. Stamens 10. Pods straight, oblong, with a minute beak at apex. Seeds 4-8. Flowers during the rains.

In fallow fields and moist places.

Mimosa, Linn.

Herbs, shrubs or small trees. Stems prickly. Leaves twice pinnate. Leaf-stalk prickly. Flowers small. Calyx very small, shortly 4-toothed. Petals 4, slightly united below, valvate. Stamens as many or twice as many as the petals. Pods flat, thin, of several 1-seeded segments.

A low shrubby herb, sparingly prickly; leaves with two pairs of pinnae pudica.

A tall very prickly shrub; leaves with more than two pairs of pinnae hamata.

Mimosa pudica, Linn. The Sensitive Plant

தொட்டாற்றிணுங்கி அஞ்சுதல்

A spreading shrubby herb. Stems and branches sparingly prickly. Leaves sensitive, with 1 or 2 pairs of pinnae. Leaflets 12-20 pairs for each pinna, $\frac{1}{4}$ in. long. Flowers pink, in round heads, $\frac{1}{3}$ in. in diameter. Lobes of calyx and corolla and stamens 4 each. Pods flat, slightly curved, up to 1 in. long, furnished with bristles on the edges, consisting of 3-5 one-seeded segments. Flowers October to March.

This plant has been introduced from South America. Occasionally found wild in Madras City. Very common in other parts of the presidency.

Mimosa hamata, Willd.

A very prickly much-branched shrub. Leaves with 3-6 pairs of pinnae. Leaflets 6-10 pairs. Flowers pink, crowded in the axils of leaves and at ends of small branches. Heads $\frac{5}{8}$ -1 in. in diameter. Lobes of calyx and corolla 4 each. Stamens 8. Pods flat, curved, prickly at the edges, consisting of 4-8 one-seeded segments, 2-3 in. long, $\frac{1}{2}$ in. broad. Flowers in November and December.

Common on Vandalur Hills and occasional in other jungly places near the city.

Parkia, R. Br.

Tall trees. Leaves twice pinnate. Corolla tubular. Stamens 10. Pod flat, strap-shaped, leathery.

Parkia biglandulosa, Wt. & Arn.

A large tree. Leaves with 20-40 pairs of pinnae and 60-100 pairs of minute leaflets. Flower-heads spherical, $1\frac{1}{2}$ in. in diameter, on stalks 8 in. long. A native of Malaya occasionally planted in gardens.

Desmanthus, Willd.

Shrubby plants. Leaves twice pinnate. Petals 5. Stamens 10. Pods linear, straight, leathery.

Desmanthus virgatus, Willd.

A glabrous shrub 3-4 ft. high with straight slender branches. Pinnae 6-8. Leaflets 30-40. Flowers in round heads in the axils of leaves, one head in each axil. Pods 2-3½ in. long, 20- to 30-seeded. Flowers October to December.

This is a native of Tropical America now thoroughly naturalized here.

Leucaena, Benth.

Trees or shrubs. Leaves twice pinnate. Flowers in dense heads in the axils of leaves. Petals 5. Stamens 10. Pods flat, strap-like, leathery.

Leucaena glauca, Benth.

Shrubs often growing to trees. Pinnae 8-16. Leaflets 20-30, thin, covered with a whitish bloom, finely downy. Heads white, very dense, often in pairs. Pods straight, 15- to 20-seeded, 5-6 in. long, ½ in. broad. Flowers October to December.

This is a native of Tropical America which has become thoroughly naturalized here. Often found on old walls or waste places where it flowers when it is hardly 2 ft. high.

Adanathera, Linn.

Trees. Leaves twice pinnate. Pinnae opposite. Leaflets alternate. Flowers in spike-like racemes. Stamens 10, alternately long and short. Pods much twisted after breaking open. Seeds thick.

Adanathera pavonina, Linn.

ஆனைக்குன்றிமணி, மஞ்சாடிமரம் ஐடைநுருங்க

A large tree. Leaflets many, ovate-oblong, about 1 in. long. Flowers small, pale yellow, conspicuous. Pods curved, with beautiful shining scarlet seeds. The seeds are used as jeweller's weights and as beads. A native of the West Coast frequently grown on roadsides and in gardens. Museum compound.

Prosopis, Linn.

Thorny shrubs or trees. Leaves twice pinnate. Leaflets many, small, narrow. Flowers small. Petals 5. Stamens 10. Pods pulpy inside.

Prosopis spicigera, Linn.

Pl. X, E. ஐடிபெட்டி

A medium-sized very thorny tree. Pinnae usually 4. Leaflets 14-24. Flowers yellow, arranged in spikes in the axils of leaves and also at ends of branches. Pods cylindrical, much constricted between the seeds and containing pulp, 4-8 in. long. Flowers April to July.

In jungly places. Adyar. The pods are fed to cattle.

Dichorostachys, DC.

Thorny shrubs. Leaves twice pinnate. Leaflets very small and numerous. Flowers in cylindrical spikes on short axillary branchlets, upper flowers yellow and bisexual, lower one pink and neuter. Petals 5. Stamens 10. Pod linear, much twisted when ripe.

Dichorostachys cinerea, Wt. & Arn.

వెలుగురు చెట్టు, వెలుగురు చెట్టు

A very thorny shrub or small tree with thorny branches. Pinnae 16-28. Leaflets 24-40, very close-set, linear, minute. Flowers in spikes in the axils of leaves. The upper male flowers yellow, the lower neuter ones pink. Fruit a flat pod, much twisted when ripe, 2-3 in. long. Flowers almost all through the year.

Very common in the scrub jungle at Avadi, Guindy Park, Pallavaram and Vandalur.

Acacia, Willd.

Trees or shrubs, usually prickly. Leaves evenly twice pinnate. Stipules often spiny. Flowers small in round heads or cylindrical spikes. Stamens numerous. Pods variable.

- | | | | | | | |
|---|-----|-----|-----|-----|-----|--------------|
| 1 An erect tree or a shrub | ... | ... | ... | ... | ... | 2 |
| A climbing shrub | ... | ... | ... | ... | ... | caesia. |
| 2 Flowers in round heads | ... | ... | ... | ... | ... | 3 |
| Flowers in cylindrical spikes | ... | ... | ... | ... | ... | Sundra. |
| 3 Flower-heads clustered in the axils of leaves | ... | ... | ... | ... | ... | 4 |
| Flower-heads arranged in panicles at ends of branches | ... | ... | ... | ... | ... | leucophloea. |
| 4 Pods constricted between the seeds | ... | ... | ... | ... | ... | arabica. |
| Pods not constricted between the seeds | ... | ... | ... | ... | ... | Farnesia na. |

Acacia caesia, Willd. (Acacia Intsia, Wt. & Arn.)

A climbing shrub with rather large prickles on the stems. A conspicuous gland present near the base of the leaf-stalk. Pinnae 6 pairs. Leaflets 10-12 pairs, fairly large for the genus. Flower-heads white, in panicles in the axils of leaves and at ends of branches, about $\frac{1}{2}$ in. in diameter. Pods thin, flat, leathery, 4-5 in. long, 1 in. broad. Flowers in October and November.

Vandalur and the jungly places near the city.

Acacia Sundra, DC.

చంద్ర

A moderate-sized thorny tree. Leaves twice pinnate. Pinnae 4-10. Leaflets 40-80 to each pinna. Flowers in spikes in the axils of leaves, yellowish-white. Fruit a thin flat brown pod 2-3 in. long. Flowers July to November.

Guindy Park.

Acacia leucophloea, Willd.

வெள்ளவேலமரம் செல்குச்சு

A fairly large thorny tree. Leaves twice pinnate. Pinnae 10-33. Leaflets 24-60 in each pinna, crowded. Flowers white, in small globose heads arranged in large panicles at ends of branches. Pods thin, flat, usually curved, brown, 4-8 in. long. Flowers August to October.

A very common tree.

Acacia arabica, Willd. The Babul

கருவேலமரம் நல்லுச்சு

A moderate-sized thorny tree. Leaves twice pinnate. Pinnae 8-18. Leaflets 20-50 in each pinna. Flowers in round, golden-yellow heads arranged in clusters in the axils of leaves. Fruit a flat grey pod much constricted between the seeds. Flowers July to October.

The commonest of the Acacias.

Acacia Farnesiana, Willd.

பீவேலமரம் கంఠகுச்சு

A large thorny shrub. Leaves twice pinnate. Pinnae 8-16. Leaflets 20-40 for each pinna. Flowers in globose heads clustered in the axils of leaves, bright yellow, very sweet scented. Fruit a cylindrical, slightly curved pod 2-3 in. long. Flowers October to February.

A native of South America now thoroughly naturalized here. Very common at Ennur. The scent known as "Cassie" is prepared from the flowers.

Enterolobium, Mart.

Large trees. Leaves twice pinnate. Stamens numerous. Pod with partitions between the seeds.

Enterolobium Saman, Prain (*Pithecolobium Saman*, Benth.) The Rain Tree

சீமைக்காட்டுவாகை

A large quick-growing tree. Pinnae 4 or 5 pairs. Leaflets 5-7 pairs, oblong, the two halves unequal, softly hairy on the under surface, glabrous on the upper surface, 1-1½ in. long. Flower-heads large, pinkish. Pods straight, not breaking open, having sugary pulp round the seeds. Flowers at various parts of the year.

A native of Central and South America. Very common as a shade tree.

Pithecolobium, Mart.

Trees or shrubs, often spiny. Leaves twice pinnate. Flowers in round heads arranged in clusters or in racemes. Petals 5. Stamens united into one group. Pods much twisted.

Pithecolobium dulce, Benth.

கொறுக்காய்ப்புளி சீமந்தம்

A large thorny tree, the thorns representing stipules. Leaves twice pinnate. Pinnae 2. Leaflets 2, obovate-oblong, glabrous, 1-2 in. long. Flowers in globose heads in the axils of leaves, white. Fruit a twisted leathery pod. The fleshy whitish pulp round the seed is eaten. Flowers November to March.

This tree is a native of Mexico introduced into India from the Philippine Islands. It is often used as a hedge plant.

Albizzia, Durazz.

Trees or shrubs without thorns or prickles. Leaves twice pinnate. Flowers in heads. Petals 5, united into a funnel-shaped corolla. Stamens numerous. Pod large, thin, flat, straight.

Leaflets 1-1¾ in. long	...	..	...	...	...	Lebbeck.
Leaflets ¼-⅓ in. long	...	...	...	...	...	amara.

Albizzia Lebbeck, Benth.

வாழை கிளிநீர்

A large tree. Pinnae 4-8. Leaflets 10-18, elliptic-oblong, two halves unequal, upper surface glabrous, 1-1¾ in. long. Flowers in heads, rather large, whitish, scented. Fruit a broad flat dry yellow pod 5-12 in. long. Flowers in March and April.

Fairly common. Pallavaram Hills. Vandalur.

Albizzia amara, Boivin

தூரிஞ்சில் பல்லாங்க

A moderate-sized tree. Pinnae 6-15 pairs. Leaflets numerous, very small, close-set, sessile, linear-oblong, upper surface glabrous, under surface somewhat pubescent, ¼-⅓ in. long. Flowers pinkish-white, scented, in globose heads in the axils of leaves. Fruit a narrow flat brown pod 4-7 in. long, 1-1¼ in. broad. Flowers March to July.

Vandalur Hills.

Rosaceae

No genus of this order is native in Madras but many species and varieties of *Rosa* are cultivated in gardens. The common species in Madras is the pink or Edward Rose. ரோஜா, ரோஸ். The Devonian Rose has white flowers and is also familiar in Madras gardens.

Saxifragaceae

Herbs (shrubs or trees). Leaves opposite (or alternate). Calyx more or less adherent to the ovary. Petals 5. Stamens 5, sometimes 10, inserted with the petals. Ovary inferior or partly inferior, 1- or 2-celled. Fruit a capsule or a berry.

Vahlia, Thunb.

Herbs. Leaves opposite, entire. Flowers small, usually in pairs in the axils of leaves. Calyx-tube adherent to the ovary, 5-lobed. Petals and stamens 5 each. Ovary inferior, 1-celled, many-ovuled. Styles 2. Fruit a capsule splitting at the apex between the styles.

Flowers carried on stalks oldenlandioides.

Flowers not carried on stalks or stalks very short ... viscosa.

Vahlia oldenlandioides, Roxb.

An erect or prostrate branching herb. Leaves not distinctly stalked, linear, $\frac{1}{3}$ -2 in. long. Petals white. Capsule round, about $\frac{1}{8}$ in. in diameter. Flowers September to January.

In sandy places.

Vahlia viscosa, Roxb.

Pl. XIII, A.

An erect or prostrate branched herb covered with short sticky hairs. Leaves not distinctly stalked, narrowly oblong, narrowed at both ends, $\frac{2}{3}$ -1 in. long. Calyx-tube covered with short glandular hairs. Petals white, small. Capsule rounded, about $\frac{1}{8}$ in. in diameter. Flowers January to April.

In fields near Tiruvanmiyur and also near Perambur and Chetpat.

Crassulaceae

Succulent herbs. Leaves alternate or opposite. Stipules not present. Flowers at ends of branches. Sepals 4 or 5, united or free. Petals 3 or 5, often united together. Stamens as many or twice as many as the petals. Ovaries as many as petals, each developing into a fruit containing several seeds and bursting open at maturity along its inner side. A small scale present at the base of each ovary.

Bryophyllum, Salisb.

Erect perennial herbs. Leaves opposite, crenate. Flowers on slender stalks and arranged in oppositely-branched panicles. Calyx inflated, cylindrical, 4-toothed. Corolla with 4 divergent teeth. Stamens 8, inserted on the corolla-tube. Ovaries 4, each with one style.

Bryophyllum pinnatum, Kurz (*Bryophyllum calycinum*, Salisb.) The Air Plant

Stem obtusely 4-angled, transversely ridged at the nodes, younger parts reddish speckled with white. Some leaves simple and some compound, the latter having 3 leaflets. Calyx-tube green tinged with red at the base, $1\frac{1}{2}$ in. long. Corolla tubular, longer than the calyx, swollen at the base, constricted below the middle, green, teeth tinged with red. Stamens 8, inserted on the constricted part of the corolla-tube. Fruit enclosed in the dry papery calyx and corolla which do not fall off at maturity. Flowers December to February.

A native of Tropical Africa, now thoroughly naturalized. Cultivated in gardens and also frequently found as an escape near gardens. Adyar and Nungambakam.

This is an example of a plant which multiplies by vegetative reproduction. Buds with roots, stems and leaves are often developed on the margins of leaves. These fall to the ground and develop into new plants. A detached leaf suspended in air continues to live for a number of days and puts forth a number of buds, hence the name Air Plant. It took over two months for a specimen to get thoroughly dried in the herbarium and even under a heavy weight buds with roots and stem continued to develop from the leaves.

Droseraceae

Perennial herbs covered with gland-tipped hairs. Leaves coiled in bud. Sepals and petals 5 each, imbricate. Stamens 5. Ovary 1-celled. Styles 3-5. Fruit a capsule. Seeds many.

Drosera, Linn. The Sundews

Low herbs. Leaves either all in a tuft at the base or alternate, margins with numerous gland-tipped hairs. Petals soon falling. Styles 2-5. Capsule 1-celled, splitting into 2-5 pieces.

The glands of the leaves exude drops of a clear sticky fluid which attract insects and entangle them. The leaves then secrete a digestive fluid which dissolves the insect. The product is then assimilated by the plant.

Leaves spatula-shaped, forming a tuft at the base	...	...	Burmanni.
Leaves linear, narrow, alternate	...	...	indica.

Drosera Burmanni, Vahl

Pl. XI, A.

Leaves arranged in a tuft 1 in. across at the base of the erect flower-stalk, wedge-shaped at the base, rounded at the top, upper surface covered with numerous gland-bearing hairs, $\frac{1}{3}$ in. long. Stipules scale-like. Flowers arranged in a one-sided few-flowered raceme on the upper part of the axis. Axes 1-3, 2-3 in. long. Petals white. Styles 5, undivided. Flowers December to February.

In damp places at Ennur, particularly on the borders of the pond opposite to the railway station. Red Hills.

Drosera indica, Linn.

A weak-stemmed somewhat erect herb. Leaves alternate, narrow, linear, the upper portion copiously fringed with very fine gland-tipped hairs, 1 in. long. Flowers in racemes 3-8 in. long, opposite to the leaves. Petals pink. Styles 3, each 2-branched. Flowers in January and February.

Vandalur, on the borders of the tank. This species is said to have been common in Madras City some years ago but has now disappeared.

Combretaceae

Trees or shrubs, sometimes climbing. Leaves alternate or opposite. Flowers in spikes, racemes or panicles. Calyx-tube adherent to the ovary and produced above it; limb 4- or 5-lobed. Petals 4 or 5, frequently absent, inserted on the calyx. Stamens as many as the calyx-lobes or twice as many. Ovary inferior, 1-celled.

1	Petals absent	...	...	...	...	...	...	...	2
	Petals present	...	...	...	...	...	...	...	3
2	Erect trees	...	...	...	...	...	...	...	Terminalia.
	Straggling shrubs	...	...	...	...	...	...	...	Calycopteris.
3	Calyx-tube not extending beyond the ovary	...	...	...	...	...	...	...	Combretum.
	Calyx-tube extending more than $\frac{1}{2}$ in. beyond the ovary	...	...	...	...	...	...	...	Quisqualis.

Terminalia, Linn.

Trees. Leaves alternate or almost opposite, often with glands on the leaf-stalks. Flowers small, green or white, in spikes or panicles. Calyx-tube constricted above the ovary. Petals absent. Stamens 10. Ovary inferior, 1-celled. Fruit ovoid, smooth, angular or winged, with 2-5 wings, not splitting.

Terminalia Arjuna, Wt. & Arn.

மருதமரம் தேவதா

A large and handsome tree. Trunk often buttressed. Bark smooth, grey. Leaves oblong or elliptic-oblong, 4-6 in. long. Flowers in spikes in the axils of leaves or in racemes at ends of branches, yellowish, with a faint smell. Fruit ovoid, with 5 short wings, brown, 1-1½ in. long. Flowers March to May. Stands bare of leaves January to March.

A common avenue tree in Madras. Occasionally planted in gardens. A native of hill-forests in most districts of South India.

Terminalia Cattappa, Linn. The Indian Almond

வாதுமை வாசம்

A moderate-sized tree. Leaves large, obovate, turning red before falling. Fruit ellipsoid, with a flattened margin. The kernel is edible but is far inferior to that of almond. The leaves are stitched together to make "elai."

A native of the Moluccas. Frequently cultivated in Madras.

Terminalia bellerica, Roxb. The Belleric Myrobalan

தான்றி தாலூ

A fair-sized tree. Leaves elliptic-obovate, 4-8 in. long. Flowers greenish-yellow, scented, arranged in spikes in the axils of leaves. Fruit round, smooth, $\frac{1}{2}$ -1 in. in diameter, used in medicine and in tanning. A native of deciduous forests throughout the Presidency. Occasionally found in Madras gardens.

Calycopteris, Lamk.

Climbing shrubs. Leaves opposite. Flowers in dense racemes in the axils of leaves or crowded in large panicles at ends of branches. Calyx-tube long, produced above the ovary, 5-lobed; the lobes remaining on the fruit and growing with it. Petals absent. Stamens 10. Ovary 1-celled. Fruit ovoid, 5-ribbed, 1-seeded.

Calycopteris floribunda, Lamk.

A large straggling shrub. Leaves ovate-lanceolate or elliptic-oblong, softly hairy, 3-5 in. long. Flowers yellowish-green. Fruit narrowly ovoid, crowned by the enlarged calyx, 5-ribbed, $\frac{5}{8}$ in. long. Flowers March to July.

This species has been included on the authority of Mr. Fischer.

Combretum, Linn.

Shrubs, usually straggling or climbing. Leaves opposite. Flowers unisexual, arranged in panicles of spikes. Calyx-tube constricted above the ovary, upper part bell-shaped or funnel-shaped; lobes 4 or 5. Petals as many as the calyx-lobes. Stamens twice as many as the calyx-lobes. Ovary inferior, 1-celled. Ovules 2-5. Fruit with 5 ridges or wings. Seed single.

Combretum ovalifolium, Roxb.

A large climbing shrub. Leaves elliptic or elliptic-lanceolate, glabrous, 2-4 in. long. Flowers white, in paniced spikes. Fruit ellipsoid, with 4 wide papery wings, $\frac{3}{4}$ in. long. Flowers in February and March.

Vandalur Hills.

Quisqualis, Linn.

Large straggling or climbing shrubs. Leaves opposite. Flowers in short spikes, white or red. Calyx produced into a tube above the ovary, 5-lobed. Petals 5. Stamens 10, short. Ovary 1-celled. Ovules 3 or 4. Fruit dry, 5-angled or 5-winged.

Quisqualis indica, Linn. Rangoon Creeper

ரங்குன் மல்லிகை

A large climbing shrub. Leaves elliptic, acuminate, glabrous above, hairy beneath, 3-4 in. long. Flowers numerous, hanging, very showy, fragrant, long-tubed, changing colour from deep pink to white. Calyx $2\frac{1}{2}$ in. long. Petals $\frac{1}{2}$ in. long.

A native of Java and the Malay Peninsula. Very commonly cultivated in gardens and often found run wild.

Myrtaceae

Trees or shrubs. Leaves opposite, simple, entire, scented owing to the presence of oil. Calyx adherent to the ovary; lobes 4 or 5. Petals 4 or 5, falling away soon after the flower opens. Stamens very often curled inwards in bud. Ovary inferior, usually 2-celled. Fruit usually a berry, often crowned by the persisting calyx.

- | | | | | | | | |
|--|-----|-----|-----|-----|-----|-----|-----------------------|
| 1 Ovary many-celled | ... | ... | ... | ... | ... | ... | Psidium (cultivated). |
| Ovary 2-celled | ... | ... | ... | ... | ... | ... | 2 |
| 2 Tubular part of calyx not produced beyond the ovary; | | | | | | | |
| stamens erect or slightly bent in bud | | | | ... | ... | ... | Eugenia. |
| Tubular part of calyx produced beyond the ovary; stamens | | | | | | | |
| bent inwards and doubled up in bud | | | | ... | ... | ... | Syzygium. |

Psidium, Linn.

Trees or shrubs. Leaves not dotted with oil-glands. Flowers fairly large, white. Ovary with 2 or more cells, with many ovules in each cell. Berry many-seeded.

Psidium Guajava, Linn. The Guava

கொய்யாமரம்

சூது

A small tree. Trunk smooth. Leaves ovate or oblong, usually acuminate, nerves prominent, glabrous above, softly hairy beneath, 3 in. long. Flowers 1-3 together. Petals broad, scented. Fruit round or pear-shaped. Flowers August to October.

A native of South America and Mexico. It is extensively cultivated and is thoroughly naturalized.

Eugenia, Linn.

Trees or shrubs. Leaves dotted with oil-glands. Flowers moderately large. Calyx-tube almost globose; lobes 4. Petals 4. Stamens numerous. Ovary 2-celled. Ovules several in each cell. Fruit a globose 1- or 2-celled berry crowned with the persisting calyx. Seeds 1 or 2, large.

Eugenia bracteata, Roxb.

A shrub. Leaves elliptic or ovate, obtusely acute, narrowed at the base, margins curved back, glabrous, shiny above, $1\frac{1}{2}$ - $2\frac{1}{2}$ in. long. Flowers forming clusters in the axils of leaves, white, about $\frac{1}{2}$ in. in diameter. Fruit globose, yellow, about $\frac{1}{3}$ in. in diameter. Flowers April to December.

Guindy Park.

Syzygium, Gaertn. (*Eugenia*, Linn.)

Trees or shrubs. Leaves often dotted with oil-glands. Flowers small, arranged in cymes, usually in a corymb-like manner. Calyx-tube funnel-shaped, 4-lobed. Petals 4, soon falling. Stamens very numerous, bent inwards at the middle when in bud. Ovary 2-celled. Ovules several in each cell. Fruit a 1-celled, 1- or few-seeded berry, crowned by the persisting calyx.

Syzygium Jambolanum, DC. (*Eugenia Jambolana* Lamk.) The Indian Cherry

நாவல்மரம் Pl. XI, B. நேரேடி

A large evergreen tree. Leaves lanceolate, elliptic or ovate, glabrous, shiny above, leathery, nerves close together, 3-4 $\frac{1}{2}$ in. long. Flowers white, scented, arranged in panicles. Petals white, soon falling, $\frac{1}{4}$ in. across. Fruit broadly ovoid, 1-seeded, pulpy, deep purple, covered with bloom, $\frac{1}{3}$ -1 in. long. Seeds single. Flowers May to August. The fruit is edible.

Common. Guindy Park. Museum compound.

Couroupita guianensis, Aubl. The Cannon-ball Tree

நாகலிங்கம் நாகலிங்கம்

Leaves alternate, oblong-ob lanceolate, entire, glabrous, nerves prominent, up to 1 foot long. Flowers large, rose-pink, with a strong agreeable odour, arranged in long racemes proceeding from the upper part of the trunk or from the main branches. Stamens numerous, arranged on a band that arises from the base of the ovary and bends over it like a hood so that the anthers press down on the ovary. Some abortive stamens also present at the base of the band. Fruit round, with a brown hard shell, containing pulp, up to 10 in. in diameter.

A native of Tropical America found in Madras gardens. Some people consider this tree sacred to Shiva on account of the fancied resemblance of the ovary and the staminal pad to the image of Shiva and the hood of a serpent respectively.

Lecythidaceae

Trees. Leaves usually crowded at the ends of branchlets. Flowers fairly large. Calyx-tube enclosing the ovary. Sepals and petals 4-6 each. Stamens many, in several series. Ovary 2- to 6-celled. Ovules many. Fruit a fleshy or fibrous berry with 1 or many seeds.

Fruit angular, fibrous, 1-seeded; stamens all bearing anthers. *Barringtonia*.

Fruit round, fleshy, many-seeded; some stamens not bearing

anthers *Careya* (planted).

Barringtonia, Forst.

Flowers in racemes or spikes. Calyx-tube produced above the ovary. Petals 4, imbricate in bud. Ovary inferior, 2- to 4-celled.

Barringtonia acutangula, Gaertn.

சமுத்திரப்பாலை Pl. XI, C.

A medium-sized tree. Leaves obovate, 2-6 in. long. Racemes long and hanging. Flowers scented, pink. Fruit ovoid, bluntly quadrangular, 1½ in. long. Flowers August to November.

On the banks of the Adyar near the sea.

Careya arborea, Roxb.

பேய்த்கான்றி

A deciduous tree. Leaf-buds covered with gum. Leaves fairly large, obovate, serrate. Flowers pink and white, 2½ in. across. Fruit large, round. Flowers in April when fresh leaves also appear.

A native of forest areas near Madras and occasionally planted in gardens. Museum compound.

Melastomaceae

Leaves opposite. Flowers never standing singly. Calyx-tube adherent to the ovary; lobes 3-6. Petals as many as the calyx-lobes, inserted at the mouth of

the calyx, imbricate in bud. Stamens usually twice as many as the petals and inserted with them. Filaments bent inwards in bud. Anthers opening by pores at the apex. Connective part of anther sometimes furnished with an appendage. Ovary 3- to 6-celled. Ovules numerous. Fruit enclosed in the calyx-tube, berry-like or a capsule. Seeds many. (The genus *Memecylon* differs from other genera of this family in the following respects. Anthers opening by slits. Ovary 1-celled. Ovules few. Fruit 1-seeded.)

Ovary 1-celled; leaves with a median rib starting from the base. *Memecylon*.
Ovary 4- or 5-celled; leaves with 3 or more ribs from the base... *Osbeckia*.

Memecylon, Linn.

Shrubs or trees, glabrous. Leaves tough, nerves not conspicuous. Flowers in umbel-like cymes in the axils of living or fallen leaves. Petals 4. Stamens 8. Ovules 6-12. Fruit a berry.

Memecylon umbellatum, Burm. (*Memecylon edule*, var. *ramiflora*, C. B. Clarke)

காசாம்பு பி. XI, D. ௪௨

A large shrub, very beautiful when in flower. Leaves ovate or ovate-elliptic, glabrous, shiny above, blunt or slightly notched at apex, under 2 in. long. Flowers small, violet-blue, in umbel-like cymes along the branches. Fruit a small, yellow berry. Flowers July to September.

Avadi. Vandalur. Leaves yield a bright yellow dye.

Osbeckia, Linn.

Herbs, shrubby herbs or shrubs. Branches 4-angled. Leaves 3- to 7-ribbed from the base. Flowers often conspicuous, at ends of branches. Calyx-tube ovoid, carrying hairs or scales; lobes 4 or 5. Petals 4 or 5. Stamens 8-10. Ovary partially inferior. Ovules numerous. Fruit a capsule opening by pores at apex.

Osbeckia zeylanica, Willd.

An erect annual herb sparsely covered with strong hairs. Leaves oblong-lanceolate, narrowed at both ends, hairy on both surfaces, $\frac{3}{4}$ -1 $\frac{1}{4}$ in. long. Calyx-tube covered with stiff hairs. Flowers arranged in leafy heads. Petals pink or mauve, $\frac{3}{8}$ in. long. Anthers with a beak more than half their own length. Apex of ovary beset with bristles. Fruit ripens in March.

Vandalur.

Lythraceae

Herbs, shrubs or trees. Leaves opposite or at times whorled. Calyx-tube remaining in the fruit; lobes 3-6. Petals as many as the calyx-lobes, inserted at the mouth of the calyx-tube, sometimes altogether absent, sometimes stalked and wrinkled. Stamens as many as or twice as many as the calyx-lobes or numerous, inserted on the calyx-tube. Ovary at the bottom of the calyx-tube, 1- to 6-celled. Fruit many-seeded, splitting open along the back or irregularly.

- | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|----------------|---|
| 1 Low herbs | ... | ... | ... | ... | ... | 2 |
| Trees or shrubs | ... | ... | ... | ... | ... | 4 |
| 2 Capsule splitting along its length | ... | ... | ... | ... | Rotala. | |
| Capsule splitting irregularly | ... | ... | ... | ... | 3 | |
| 3 Walls of capsule very thin | ... | ... | ... | ... | Ammania. | |
| Walls of capsule fairly thick | ... | ... | ... | ... | Nesaea. | |
| 4 Sepals and petals 6 each | ... | ... | ... | ... | Lagerstroemia. | |
| Sepals and petals 4 each | ... | ... | ... | ... | Lawsonia. | |

Rotala, Linn.

Herbs of wet places. Leaves in whorls. Flowers very small, usually not stalked. Petals sometimes absent. Stamens 1-6, on the calyx-tube. Ovary 2- to 4-celled. Ovules many. Fruit a capsule splitting into 2-4 parts. Pieces of the capsule, as seen under a lens, transversely and closely marked with lines.

- | | | | | | |
|--|-----|-----|-----|-----|----------------|
| 1 Leaves arranged in whorls | ... | ... | ... | ... | verticillaris. |
| Leaves opposite | ... | ... | ... | ... | 2 |
| 2 Calyx with minute appendages between the teeth | ... | ... | ... | ... | 3 |
| Calyx without appendages | ... | ... | ... | ... | indica. |
| 3 Calyx-lobes very short; petals very small | ... | ... | ... | ... | leptopetala. |
| Calyx-lobes triangular; petals rather large | ... | ... | ... | ... | densiflora. |

Rotala verticillaris, Linn. (Ammania rotala, C. B. Clarke)

A small herb. Leaves arranged in whorls of 4-8, linear, up to $\frac{3}{8}$ in. long. Flowers in whorls in the axils of leaves. Calyx with 3 teeth. Petals 3, rose-coloured, falling away quickly. Stamens 3. Ovary 3-celled. Capsule ellipsoid. Flowers November to January.

Quite common in rice fields and on the borders of ponds.

Rotala indica, Koehne (Ammania peploides, Spreng.)

A much-branched herb rooting at the lower nodes. Stem reclining on the ground with the branches tending to stand erect. Leaves obovate to spatula-shaped, rounded at the apex, narrowed at base, softly hairy, $\frac{1}{2}$ - $\frac{3}{4}$ in. long; those on the flower-bearing branches much smaller, linear-oblong and looking like bracts. Flowers very small.

Calyx with 4 triangular teeth. Petals 4, small, pink. Stamens 4. Capsule ellipsoid, opening into 2 pieces. Flowers January to March.

Nungambakam, in paddy fields.

Rotala leptopetala, Koehne (*Ammania pentandra*, Roxb.)

A small herb. Stem almost erect, rooting at the base. Branches numerous, covered with flowers. Leaves oblong, $\frac{1}{2}$ - $\frac{3}{4}$ in. long; those on the branches smaller and bract-like. Calyx with 3 or 5 teeth. Petals 3 or 5, small, soon falling. Stamens 3 or 5. Capsule splitting into 3 pieces. Flowers October to January.

Very common in moist places. Spur Tank.

Near Madras the form with the parts of the flower in threes is more common than the form with the parts in fives. The specific name *pentandra* is somewhat misleading.

Rotala densiflora, Koehne (*Ammania pentadra*, Roxb.)

Pl. XII, A.

A small spreading herb with many flower-bearing branches, covered with grey hairs. Leaves oblong-lanceolate, covered with grey hairs, $\frac{1}{4}$ in. long, those on the branches very much smaller. Flowers clustered at the ends of branches. Bracteoles scale-like. Calyx with 5 teeth having scaly margins and alternating with these 5 additional teeth also present, back hairy. Petals 5, obovate, reddish. Stamens 5. Stigmatic branches 3. Capsule splitting into 3 pieces. Flowers in July and August.

In moist places.

Ammania, Linn.

Low herbs with narrow leaves. Flowers in cymes in the axils of leaves. Calyx with 4 triangular lobes. Small horn-shaped appendages present between each lobe. Petals, when present, 4. Stamens 4 or 8, on the calyx-tube. Fruit a capsule breaking irregularly, the walls very thin.

Petals present; stamens 8	...	...	...	...	...	...	octandra.
Petals absent; stamens 4	...	...	...	...	...	...	baccifera.

Ammania octandra, Linn.

Pl. XII, B.

An erect herb. Upper stem and branches 4-angled. Leaves linear-lanceolate, tapering at apex, ear-shaped at base, $1\frac{1}{8}$ -2 in. long. Flowers in 3-flowered cymes. Calyx 4-sided, the angles winged, the faces between the wings with a distinct rib in the middle, having 4 very small teeth, $\frac{1}{4}$ in. long. Petals 4, broadly obovate, rose-coloured, much wrinkled. Stamens 8. Filaments dark red. Anthers yellow. Capsule enclosed in the calyx. Flowers January to March.

On the sides of the Buckingham Canal. On the borders of tanks at Adyar.

Ammania baccifera, Linn.

கல்லுருவி Pl. XII, C. அரி வெட்டிப்புக்கை

An erect herb up to 2 ft. in height. Branches at right angles to the stem, becoming shorter upwards. Leaves oblong-lanceolate, much narrowed at base, $\frac{3}{4}$ -2 in. long. Flowers in dense clusters in the axils of leaves. Calyx with 4 short teeth. Petals absent. Capsule red, wholly covered by the calyx, breaking open irregularly about the middle. Flowers October to March.

Very common in wet places.

Nesaea, Comm.

Herbs with 4-angled stems. Leaves opposite. Stipules absent. Calyx with 4-8 lobes. Appendices on the calyx short. Petals inserted between the calyx-lobes. Stamens 4 to many, inserted on the calyx-tube. Ovary 2- to 5-celled. Capsule at first opening by a lid at the top, later irregularly below.

Nesaea lanceolata, Koehne (*Ammania lanceolata*, Heyne)

A small erect herb. Leaves oblong-elliptic, narrowed at base, $1-1\frac{1}{3}$ in. long. Flowers only 2-5 in each axil. Calyx minutely hairy; teeth 4, triangular, 4 shorter exterior teeth also present. Petals white or pink, much exceeding the calyx in length. Capsule round. Flowers in February.

Ennur, on the borders of the pond near the railway station. The pink-flowered form and the white-flowered form were observed growing side by side.

Lagerstroemia, Linn.

Trees or shrubs. Leaves opposite. Stipules soon falling. Flowers large and showy, arranged in panicles. Calyx with 6 lobes. Petals 6, inserted on the top of the calyx-tube, stalked, wrinkled, crisped on the margins. Stamens numerous, inserted near the base of the calyx-tube. Ovary 3- to 6-celled. Fruit a woody, many-seeded capsule. Seeds winged at apex.

The following two species of *Lagerstroemia* are commonly cultivated in Madras :—

Lagerstroemia Flos-Reginae, Retz. The Indian Lilac

A medium-sized deciduous tree. Leaves large, broadly elliptic, up to 8 in. long. Flowers arranged in large panicles, showy, lilac, over 2 in. in diameter. A native of the Western Ghats and hills of Northern Circars.

Lagerstroemia indica, Linn. Crepe Myrtle

A large shrub. Leaves oblong, nerves prominent, glabrous, about 3 in. long. Flowers varying in colour from pure white to dark crimson. A native of China.

Lawsonia, Linn.

Glabrous shrubs, branchlets ending in spines. Leaves opposite, entire, lanceolate. Flowers small, in panicles at ends of branches. Calyx with 4 spreading lobes. Petals 4, obovate, wrinkled, crenate, inserted at the top of the calyx-tube. Stamens 8, inserted in pairs at the base of the calyx-tube. Ovary 2- to 4-celled. Fruit a round capsule, breaking up irregularly, ultimately 1-celled. Seeds closely packed.

Lawsonia inermis, Linn. (*Lawsonia alba*, Lamk.) The Henna Plant

மருதேதான்றி ஈஃஸ்ட்

A hardy shrub about 6 ft. high. Leaves narrowed at base, $\frac{3}{4}$ -1 $\frac{3}{4}$ in. long. Flowers white, very sweet-scented. Capsule $\frac{1}{4}$ in. in diameter. Flowers at the end of the rainy weather.

Cultivated in gardens especially as a hedge-plant. The leaves are largely used by Indian women for dyeing the palms, feet and nails on marriage and other festive occasions. It is also used medicinally.

Sonneratiaceae

Trees or shrubs. Leaves opposite, entire. Calyx-tube slightly adherent to the ovary; lobes 4, valvate. Petals as many as the calyx-lobes or absent altogether. Stamens few or many, standing on the rim of the calyx-tube. Filaments bent inwards in bud. Ovary 2- to 20-celled, almost superior. Ovules numerous. Fruit a capsule or a berry.

Sonneratia, Linn.

Sea-coast trees. Flowers large, standing singly or 2 or 3 together. Calyx-tube, bell-shaped. Stamens numerous. Ovary many-celled. Style long. Fruit a 10- to 15-celled berry supported by the persisting calyx.

Sonneratia apetala, Buch.-Ham.

Pl. XII, D.

A moderate-sized evergreen tree. Leaves oblong-lanceolate, thick, tough, 2-4 in. long. Flowers standing singly or 2 or 3 together. Petals absent. Stigma shaped like an umbrella. Fruit a berry tipped with the persisting style, $\frac{3}{4}$ in. in diameter. Flowers in June and July.

In swampy tracts at the mouth of the Adyar.

Onagraceae

Herbs, mostly aquatic. Leaves opposite or alternate. Calyx-tube adherent to the ovary; lobes 2-5. Petals as many as the calyx-lobes, inserted at the top of the calyx-tube, rolled over each other in bud. Stamens as many or twice as many as the petals and inserted with them. Ovary inferior (partially inferior in *Trapa*), 1- to 6-celled with 1 or many ovules in each cell. Fruit a capsule or berry-like.

- | | | | | | | | | |
|---|--|-----|-----|-----|-----|-----|-----|-------------------|
| 1 | Leaves alternate | ... | ... | ... | ... | ... | ... | 2 |
| | Leaves, if submerged, opposite or, if floating, forming a whorl. | | | | | | | <i>Trapa</i> . |
| 2 | Stamens twice as many as the petals | ... | ... | ... | ... | ... | ... | <i>Jussieua</i> . |
| | Stamens as many as the petals | ... | ... | ... | ... | ... | ... | <i>Ludwigia</i> . |

Trapa, Linn.

Water-plants. Floating leaves rhomboidal, carried on inflated stalks. Calyx-tube short, enclosing the lower part of the ovary, with 4 lobes all or 2 of which become strong spines on the fruit. Petals and stamens 4 each. Ovary with a cone-shaped top, 2-celled. Fruit not splitting, bony, 1-celled, 1-seeded.

Trapa bispinosa, Roxb. The Water-chestnut

சுங்கா ரக்காய் ஸ்ரீரஞ்சி

Part of stem under water furnished with numerous green root-like organs. Submerged leaves cut into close, serrate narrow segments. Floating leaves as broad as or broader than long, upper side dark green and shiny, under side reddish-purple and densely covered with short soft hairs. Flowers standing singly in the axils of leaves. Petals pure white. Fruit angled, with a short conical beak at the apex and a sharp spiny horn on either side. Flowers in the rainy weather. Fruit ripening in the cold weather.

Often grown in tanks. The fruit is eaten.

Jussieua, Linn.

Calyx-tube elongate, not produced above the ovary; teeth 4-6, remaining in the fruit. Petals 4-6. Ovary 4- or 5-celled. Ovules many, in several vertical rows. Capsule 4- or 5-celled, 8- or 10-ribbed.

Jussieua repens, Linn.

Pl. XII, F.

Stem rooting at the nodes, creeping on mud or floating on water. A number of spongy outgrowths present at the nodes of floating stems. Leaves obovate or oblanceolate, narrowing into the stalk, 1-2 in. long. Petals 5, white with yellowish veins. Capsule cylindrical. Flowers in the rainy months and after.

Very common in and on the borders of ponds and tanks.

Ludwigia, Linn.

Flowers yellow, not stalked or minutely stalked, standing singly in the axils of leaves. Calyx-tube not produced above the ovary, teeth 3-5, usually remaining on the fruit. Ovary 4- or 5-celled. Ovules many, arranged in vertical rows. Fruit a 4- or 5-celled capsule opening by pores at the top or breaking up irregularly along the sides.

Ludwigia parviflora, Roxb.

Pl. XII, E.

An erect herb. Stem more or less angled, much branched. Leaves lanceolate or linear-lanceolate, narrowed at both ends, glabrous, 1-3 in. long. Calyx-lobes 4. Petals 4, as long as the calyx-lobes. Capsule oblong, 4-sided, breaking away from the ribs. Flowers in the rainy months.

Very common in rice fields and other wet places.

Turneraceae

Herbs or small shrubs covered with short soft hairs. Leaves alternate, without stipules, commonly with 2 glands on the stalks. Flowers in the axils of leaves; their stalks cohering with the leaf-stalks or free. Bracteoles 2. Calyx 5-lobed. Petals and stamens 5 each. Ovary free, 1-celled, with numerous ovules attached at 3 places on the walls of the ovary. Styles 3, often branching at the apex. Fruit a capsule splitting into 3 pieces.

This family belongs exclusively to South America and the West Indies.

Turnera, Linn.

Characters same as those of the family.

Flowers bright yellow	...	...	...	...	...	...	ulmifolia.
Flowers cream-coloured	..	..	...	...	...	...	trioniflora.

Turnera ulmifolia, Linn., var. angustifolia, Willd.

A herb. Stem hairy. Leaves lanceolate, serrate, acute, up to 4 in. long, a pair of glands present at the junction of the leaf-stalk with the blade. Flower-stalk cohering with the leaf-stalk so that the former appears to arise from the latter. Bracteoles 2, large, leaf-like. Petals bright yellow, opening in the morning and closing before midday, $1\frac{1}{2}$ in. in diameter. Capsule roundish, $\frac{1}{3}$ in. in diameter. Flowers October to March.

On roadsides and in waste places. Mylapore. By the side of the railway line between Minambakam and Pallavaram. Tiruvanmiyur, near the temple. A native of the West Indies. It was introduced as a garden plant but has now become a common weed.

Turnera trioniflora, Linn.

Pl. XIII, B.

A small shrubby herb. Leaves elliptic-lanceolate, serrate, base wedge-shaped and entire, a pair of glands present at the junction of the leaf-stalk with the blade, up to 2 in. long. Stalk of flower fused with that of the leaf. Corolla cream-coloured with a purple base, fading as soon as plucked, $1\frac{1}{4}$ in. in diameter, opening in the morning and closing before noon. Flowers September to March.

A native of Central and South America. It has established itself in Madras in waste places. People's Park. Nungambakam. Teynampet. Marina. More common than the last.

Passifloraceae

Twining herbs. Leaves alternate, simple, lobed. Tendrils present in the axils of leaves or not. Flowers often showy. Bracteoles 3. Calyx with 5 imbricate lobes. Petals 5, inserted on the tube of the calyx, imbricate, fading and falling off very soon. A corona of radiating filaments always present on the throat of the calyx. Stamens 5. Ovary 1-celled, many-ovuled. Styles usually 3. Fruit a fleshy berry (or a capsule). Seeds many.

Passiflora, Linn. The Passion Flowers

Characters same as those of the family except that stamens and ovary are carried on a stalk.

Passiflora foetida, Linn.

Pl. XIII, C.

An annual hairy tendril-climber, the entire plant having a foetid smell. Leaves ovate, cordate at base, 3-lobed, acuminate at apex, hairy on both surfaces, 3-5 in. long. Flowers enclosed by a moss-like involucre of bracts cut into fine segments and covered with sticky hairs. Petals blue, fading and falling away soon.

A native of Tropical America now run wild in waste places in and around Madras.

Caricaceae

Trees or shrubs often having an acrid milky juice. Leaves alternate, lobed, long-stalked. Flowers unisexual. Calyx 5-toothed. Petals of male flowers united together to form a sympetalous tubular corolla with 5 lobes; in the female the corolla is divided nearly to the base into 5 petals. Stamens 10, inserted on the throat of the corolla. Ovary 1-celled. Ovules indefinite, attached at 5 places on the walls of the ovary. Fruit a fleshy berry.

Carica, Linn.

Characters same as those of the family.

Carica Papaya, Linn. The Papaw

பப்பாளி பாப்பாய்செட்டு

A tree 20-30 ft. high, with weak trunk. Leaves with 7 deep, palmate segments, 1-2 ft. across. Male flowers arranged in panicles in the axils of leaves. Female flowers in short clusters, yellowish-white, scented. Fruit, with a sweet soft yellow pulp. This plant contains the ferment papain which possesses similar properties to pepsin. It is a native of the West Indies and the shores of the Gulf of Mexico and is widely cultivated throughout Tropical Asia.

Cucurbitaceae

Creeping or climbing herbs bearing tendrils. Leaves alternate, palmately-lobed or -veined. Flowers with stamens only or ovary only; the male and female flowers sometimes on separate plants. Calyx-tube adherent to the 1-celled ovary. Petals 5, often united together, yellow or white. Stamens 3. Anthers curved or straight, united or free, one 1-celled and two 2-celled. Ovules many, inserted at 3 places on the walls or on projections from the walls of the ovary. Fruit usually a fleshy berry.

- | | | | | | | |
|---|---|-----|-----|-----|-----|---------------------------------|
| 1 | Anther-cells folded or wavy | ... | ... | ... | ... | 2 |
| | Anther-cells straight | ... | ... | ... | ... | 11 |
| 2 | Corolla divided to the base or nearly so | ... | ... | ... | ... | 3 |
| | Corolla divided less than half way down | ... | ... | ... | ... | 10 |
| 3 | Petals with fringed margins | ... | ... | ... | ... | Trichosanthes, p. 127. |
| | Petals entire | ... | ... | ... | ... | 4 |
| 4 | Calyx-tube of male flowers long; anthers not protruding beyond the mouth of the corolla | ... | ... | ... | ... | Lagenaria (cultivated), p. 128. |
| | Calyx-tube of male flowers short; anthers protruding beyond the mouth of the corolla | ... | ... | ... | ... | 5 |
| 5 | Stamens inserted at the mouth of the calyx; male flowers usually with a large bract | ... | ... | ... | ... | Momordica, p. 128. |
| | Stamens inserted inside the calyx-tube | ... | ... | ... | ... | 6 |
| 6 | Male flowers in racemes; fruit with a fibrous network inside | ... | ... | ... | ... | Luffa, p. 128. |
| | Male flowers solitary or in dense clusters | ... | ... | ... | ... | 7 |
| 7 | Calyx-lobes narrow, entire, erect | ... | ... | ... | ... | 8 |
| | Calyx-lobes large, serrate, turned backwards; a large hairy climber | ... | ... | ... | ... | Benincasa (cultivated), p. 129. |
| 8 | Undeveloped ovary present in the male flower | ... | ... | ... | ... | 9 |
| | Undeveloped ovary absent from the male flower | ... | ... | ... | ... | Bryonopsis, p. 130. |

- | | | |
|----|--|------------------------|
| 9 | Tendrils unbranched; connective part of anther produced. | Cucumis, p. 130. |
| | Tendrils 2- or 3-branched; connective part of anther not produced | Citrullus, p. 131. |
| 10 | Filaments united; flowers white | Coccinia, p. 131. |
| | Filaments free; flowers yellow | Cucurbita |
| | | (cultivated), p. 132. |
| 11 | Style with a ring-like disk at the base | Melothria, p. 132. |
| | Style without a disk at the base | 12 |
| 12 | Leaf-stalk having a stipule-like bract at the base; connective part of anther not produced at apex | Blastania, p. 133. |
| | Leaf-stalk without a stipule-like bract at the base; connective part of anther produced at apex | 13 |
| 13 | Fruit not breaking open | Kedrostis, p. 133. |
| | Fruit breaking open by the top coming off as a lid from near the base | Corallocarpus, p. 134. |

Trichosanthes, Linn.

Climbing herbs. Leaves palmately lobed or sometimes entire. Flowers white, male and female on separate plants. Male flowers in racemes. Female flowers standing singly. Calyx-tube long, 5-lobed. Petals 5, united at base, margins fringed. Anthers united together, two 2-celled, the third 1-celled. Fruit a glabrous, smooth berry.

Trichosanthes palmata, Roxb.

சவரி

A large climber. Stem grooved. Tendrils 2- or 3-cleft. Leaves palmately 3- to 5-lobed, nearly as broad as long, darker above, with dark-coloured circular glands scattered along the lower side, glabrous, rough, base cordate, margins distantly serrate, $2\frac{1}{2}$ -5 in. long. Male flowers in 5- to 10-flowered racemes. Bracts broadly ovate, white, spotted with green, fringed, 1 in. long. Calyx-tube $1\frac{1}{2}$ in. long. Corolla fringed, 1 in. long. Female flowers with ten orange streaks. Flowers in November.

Collected near Teynampet in 1922. Female flowers not collected. Not common.

Trichosanthes Anguina, Linn. The Snake Gourd

புடல் சாட்டி

Well known in kitchen gardens.

Lagenaria, Ser.

Lagenaria vulgaris, Ser. The Bottle Gourd

சுரை நூர்

A climbing herb. Leaves somewhat circular, 5-angled or -lobed, softly hairy on both surfaces, 6 in. in diameter. Flowers large, white, standing singly, 2 in. across. Peduncle of male flower 6 in. long; that of female 1 in. long. Fruit bottle-shaped or dumb-bell-shaped, up to $1\frac{1}{2}$ ft. long. Cultivated for its fruit which, though insipid, are cooked and eaten when young. The shell of the ripe fruit is employed in making musical instruments and is also used by beggars as a receptacle for alms.

Momordica, Linn.

Climbing herbs with unbranched tendrils. Male and female flowers on the same plant or on different plants. Female flowers solitary or in racemes. Corolla bell-shaped or spreading out from a short tube.

Momordica dioica, Roxb.

பாக்கர்

Roots thick. Leaves ovate, cordate at base, sometimes with 3 in distinct lobes, margin toothed, $1\frac{1}{4}$ -3 in. long. Male and female flowers on separate plants. Flower-stalks in both male and female flowers 2 in. or more in length. Bract of male flower at the top of the stalk, enclosing the expanded yellow flower, usually hairy. Petals nearly 1 in. long. Bracts of female flowers small, placed below the middle of the flower-stalk. Fruit ovoid, with a short beak, densely covered with soft spines, 1-3 in. long. Seeds embedded in a red pulp. Flowers in the rainy weather.

In waste places.

Momordica Charantia, Linn. The Bitter Gourd

பாகல் கச்சு

Frequently cultivated and sometimes found self-sown in waste places.

Luffa, Tourn.

Climbing herbs with 2- to 5-branched tendrils. Leaves 5- to 7-lobed. Male and female flowers on the same plant. Female flowers standing singly, often arising from the same axil as the male raceme. Petals entirely free. Stamens 3, sometimes 5. Fruit ultimately becoming dry.

Stamens 5; fruit smooth aegyptiaca.

Stamens 3; fruit with 10 sharp angles acutangula.

Luffa aegyptiaca, Mill. The Loofa

நுரைப்பீர்க்கு

நெய்தல்

Stem 5-angled. Tendrils usually 3-branched. Leaves 5-lobed, lobes acute or tapering to a point, distantly toothed, both surfaces rough, base kidney-shaped, 4-8 in. long. Male flowers 4-20 in a raceme. Petals obovate-oblong, deep yellow with green veins, 1 in. long. Stamens 5, separate. Female flowers usually with 5 undeveloped stamens. Fruit cylindrical, smooth, marked with longitudinal lines, 5-12 in. long. Seeds narrowly winged.

Occasionally found self-sown in open situations. Not cultivated in Madras. The young fruit is eaten as a vegetable and the fibrous network inside the dry fruit is used as a flesh-brush.

Luffa acutangula, Roxb.

பீர்க்கு

நீர்

Stems 5-angled, climbing to a considerable height. Tendrils 3-branched. Leaves almost circular in outline, palmately 5- to 7-angled, rough on both sides, cordate at base, 6-8 in. long. Male flowers in 12- to 20-flowered racemes. Petals yellow, $\frac{3}{4}$ in. long. Female flowers standing singly in the same axils as the males. Stamens 3. Fruit tapering towards the base, with 10 sharp longitudinal ridges, 6-12 in. long. Seeds black, about $\frac{1}{2}$ in. long. Flowers in March.

Extensively cultivated for its fruit which when half-grown are eaten as a vegetable. The seeds are used in medicine.

Var. *amara*, C. B. Clarke

பேய்ப்பீர்க்கு

செண்டி

Leaves and flowers smaller. Fruit obovoid, obtusely conical at both ends, 10-ribbed, bitter. Seeds smaller. Flowers in December and January.

Wild near Adyar. The whole plant is very bitter and is used in medicine, especially the seeds.

Benincasa, Savi*Benincasa cerifera*, Savi. The White Gourd or Ash Pumpkin

கலியாண பூசணி

பாடிநெய்தல்

A large climber. Leaves large, round, lobed, cordate at base. Flowers standing singly. Corolla yellow, 2 in. wide. Fruit somewhat cylindrical, green and hairy when young, ultimately covered with a white bloom, 1-1 $\frac{1}{2}$ ft. long, 8-10 in. across. Commonly cultivated. The fruit is cooked and eaten in curries and is also used in medicine.

Bryonopsis, Arn. (Bryonia, Linn.)

Tendrils 2-branched. Leaves deeply 5-lobed. Male and female flowers on the same plant and often clustered in the same axils. Anthers cohering. Female flowers with 3 short undeveloped stamens. Fruit a roundish or ovoid, pulpy, many-seeded berry.

Bryonopsis laciniosa, Naud. (*Bryonia laciniosa*, Linn.)

மெல்லிய காய்

Stems slender, angular, not hairy. Leaves covered with stiff hairs on the upper side, cordate at base, thin, margins of lobes cut into teeth, 4-6 in. long. Male flowers small, on short stalks, in clusters of 3-6. Female flowers solitary or in clusters, on shorter stalks. Fruit not stalked, round, smooth, green with white stripes, brick-red when ripe, up to 1 in. in diameter. Flowers October to December.

Common in hedges and on bushes. Vandalur, at the foot of the hills.

Cucumis, Linn

Trailing or climbing annual herbs. Stems covered with rough hairs. Leaves 3- to 5-lobed or angled. Flowers yellow. Connective part of anther produced into a crest. Fruit covered with tubercles or not.

- | | | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-----|-----|--------------|
| 1 | Fruit smooth | ... | ... | ... | ... | ... | ... | ... | 2 |
| | Fruit spiny or tubercled | ... | ... | ... | ... | ... | ... | ... | propheterum. |
| 2 | Leaves shallowly 5-angled or slightly 3-lobed; male flowers in clusters | ... | ... | ... | ... | ... | ... | ... | pubescens. |
| | Leaves deeply 5-lobed; male flowers standing singly | ... | ... | ... | ... | ... | ... | ... | trigonus. |

Cucumis propheterum, Linn.

Tendrils unbranched. Leaves deeply 3-lobed, lobes often lobed again and having rounded apices, cordate at base, rigid, rough on both sides, 1-2 in. long. Corolla about $\frac{1}{2}$ in. long. Fruit ellipsoid, green striped with white, covered with soft spines, about 1 in. long. Flowers August to November.

Common trailing on waste ground.

Cucumis pubescens, Willd.

சுக்கங்காய்

బుడబుడాయ

A climbing or trailing herb. Tendrils short. Leaves shallowly 5-lobed, cordate at base, ovate, toothed, softly hairy, obtuse at apex, up to $2\frac{1}{2}$ in. long. Flowers nearly $\frac{1}{4}$ in. long. Male flowers in small clusters; female ones standing singly. Fruit roundish, pale yellow when ripe, slightly hairy when young and ultimately becoming hairless, with very bitter pulp, 2 in. long. Seeds numerous. Flowers in the rainy season.

Common on waste ground.

Cucumis trigonus, Roxb.

காட்டுத் தும்மட்டி அடிவழிப்பு.

A trailing herb. Stems with rigid hairs. Leaves deeply 5-lobed, roughly circular in outline, cordate at base, covered with rough hairs on both surfaces, 1-2 in. long; lobes narrowed at base, toothed on the margins. Leaf-stalks also rough with hairs. Male flowers in small clusters. Female flowers standing singly. Corolla a little less than $\frac{1}{4}$ in. in length. Fruit ellipsoid or roundish, yellow when ripe, with bitter pulp, $1\frac{1}{2}$ in. long. Flowers October to December.

In jungly places near the city. Vandalur on the way to the hills.

Cucumis Melo, Linn. The Melon

முலாம் பூச்சு

Cultivated near Madras.

Cucumis sativus, Linn. The Cucumber

வெள்ளரி தீள்

Frequently cultivated near Madras.

Citrullus, Neck.

Trailing herbs covered with stiff hairs. Tendrils 2- or 3-branched. Leaves deeply 3- to 5-lobed; lobes pinnately cut, the middle one elongate. Male and female flowers on the same plant, standing singly in the axils. Female flowers with 3 undeveloped stamens.

Citrullus Colocynthis, Schrad. The Colocynthis

பேய்க்குமட்டி வெஃஹிப்பு

Tendrils 2-branched. Leaves rough on both sides. Petals light yellow, $\frac{1}{4}$ in. long. Fruit variegated dark green and white, up to 3 in. in diameter. Pulp of fruit very bitter. Common on waste ground in the rainy season. The fruit is used in medicine.

Citrullus vulgaris, Schrad. The Water Melon

பிச்சைக்காய் கரூபா

Cultivated. Fruit ripen in the hot weather.

Coccinia, Wt. & Arn. (*Cephalandra*, Schar.)

Tendrils unbranched. Flowers fairly large, white. Male and female flowers on separate plants. Corolla bell-shaped, with 5 lobes. Filaments short, united into a column. Three undeveloped stamens present in the female flower; undeveloped ovary not present in the male.

Coccinia indica, Wt. & Arn. (*Cephalandra indica*, Naud.) The Scarlet Gourd

கோவை Pl. XIII, D. கீழ்க்

Leaves 5-angled or sometimes deeply 5-lobed. Stalk of male flowers 1 in. long. Fruit smooth, oblong, bright scarlet when ripe. Seeds embedded in red pulp.

Very common in hedges. The fruit is used as a vegetable and to some extent eaten raw.

Cucurbita, Linn.

Cucurbita maxima, Linn. The Common Gourd or Squash

பெரும்பூசணி காய்க்காய்

A large, roughly hairy, annual climber. Leaves ovate, rough, 5-angled or -lobed, up to 6 in. in diameter. Flowers standing singly, large, 3-4 in. across. Corolla bell-shaped. Peduncle of male flowers 4 in. long; that of female $1\frac{1}{2}$ in. long, corky in fruit. Fruit large, 2-3 ft. in diameter; pulp and the thick rind reddish when ripe. Very commonly cultivated for its fruit which are cooked and eaten in curries.

Melothria, Linn.

Tendrils unbranched. Leaves usually quite thin. Flowers small. Male flowers rarely solitary. Female flowers solitary or in clusters or umbels. Corolla deeply lobed. Stamens inserted on the tube of the calyx. A small undeveloped ovary present in the male.

Leaves cordate at base; male and female flowers on the same plant ... maderaspatana.

Leaves shaped like an arrow-head at base and with the lobes pointing outward nearly at right angles; male and female flowers on separate plants ... heterophylla.

Melothria maderaspatana, Cogn. (*Mukia scabrella*, Arn.)

முசுமுசுக்கை Pl. XIII, E. மூசுநீர், காய்க்காய்

A climbing herb. Stem slender, covered with stiff hairs. Leaves deltoid-ovate, entire, angled or lobed, under-surface rough, 1-4 in. long. Corolla yellow, hairy outside. Connective part of anther produced. Fruit round, bright red when ripe, $\frac{1}{2}$ in. in diameter.

Very common on hedges in the rainy weather. The plant is used in medicine.

Melothria heterophylla, Cogn. (*Zehneria umbellata*, Thw.)

தெய்வநீர்

A climber arising from a perennial underground part. Stem furrowed, glabrous. Leaves triangular-lanceolate, margins obscurely toothed, obtuse at apex but provided with a sharp point, pale green and rough above, paler beneath, those at the ends of branches nearly 2 in. long. Male flowers arranged as in an umbel. Female flowers standing singly. Fruit oblong-ovoid, ribbed, bright red when ripe, nearly 2 in. long. Flowers in July and August.

Avadi, climbing on shrubs. The root and the leaves are used in Indian medicine.

Blastania, Kotschy and Peyr. (*Ctenolepis*, Hook.)

Prostrate or climbing herbs. Tendrils not branched. Leaves palmately 5- to 7-lobed, having in each axil a broad rounded bract fringed with comb-like teeth. Flowers minute. Male flowers in racemes. Female flowers standing singly in the same axils. Fruit a berry. Seeds usually 2 or 3.

Blastania Garcini, Cogn. (*Ctenolepis Garcini*, Hook.)

A slender climbing annual. Stems slender, glabrous, slightly ridged. Leaves deeply 3- to 5-lobed, hairy on both surfaces, afterwards becoming rough, 1-2 in. long and as broad; lobes obovate, constricted at base, toothed, with a sharp point at apex. Flowers yellowish-white. Fruit broader than long, bright red, glabrous, up to 4 in. long. Flowers October to December.

Ennur, in the scrub on the northern side of the backwater. Near Red Hills Tank, on dry earth.

Kedrostis, Medik. (*Rhynchocharpa*, Schrad.)

Prostrate or climbing herbs with a perennial underground part. Flowers small. Male flowers in racemes. Female flowers standing singly. Connective part of anther produced above the cells in male flowers. Ovary ovoid, beaked. Fruit an ovoid, beaked berry.

Kedrostis rostrata, Cogn. (*Rhynchocharpa foetida*, C. B. Clarke)

A prostrate or climbing herb. Stems sparsely and minutely hairy. Tendrils not branched. Leaves rather circular in outline, often slightly 5-angled, cordate at base, margins slightly and distantly toothed, bright green, hairy and slightly rough on both sides, $\frac{3}{4}$ -2 in. long. Male flowers in 2- to 4-flowered racemes. Corolla pale yellow. Fruit dark red, ovoid, tapering to a long beak, softly hairy, about 1 in. long. Flowers in January and February.

Ennur, near the scrub jungle on the northern side of the bridge. The root is used in Indian medicine.

Corallocarpus, Welw.

Prostrate or climbing herbs. Tendrils not branched. Flowers minute ; the male ones in small crowded racemes on long peduncles ; the female ones standing singly on short stalks in the same axils as the males. Connective part of anther produced beyond the cells. Ovary ovoid, beaked. Fruit an ovoid, beaked, fleshy berry breaking open near the base and the entire top portion coming off.

Corallocarpus epigaeus, Hook.

கொல்லன் கோவை, ஆகாச்சுருடன் நாகன்குடி

A thick-stemmed climber arising from a large tuberous underground part which has more or less the shape of a stout turnip. Stem glabrous, grooved. Leaves roundish in outline, 3- to 5-lobed, lobes more or less toothed on the margins, glabrous, light green above, paler beneath, $\frac{3}{4}$ -2 in. long. Corolla greenish-yellow. Fruit stalked, nearly 1 in. long including the beak, ellipsoid, abruptly contracted into a slender beak $\frac{1}{4}$ in. long, scarlet in the middle, the base and the beak green, breaking open at the junction of the green and red portions near the base. Seeds 6-9, in orange-coloured pulp. Flowers and fruit ripens in November.

Vandalur Hills. The plant is used in Indian medicine.

Begoniaceae

Fleshy herbs. Leaves alternate, unequal-sided, Stipules 2, often falling away. Flowers usually showy, white, pink or yellow, either male or female, arranged in regularly branching cymes. Male flowers with perianth of 2 sepals meeting by their edges, with or without an inner smaller pair. Stamens numerous. Female flowers with perianth of 2-6 sepals, the 2 outer usually larger. Ovary inferior, usually 3-celled and 3-winged. Ovules numerous. Styles 2-4, free or united. Fruit a capsule, usually winged, breaking open along 3 lines.

Begonia, Linn.

Characters same as those of the family.

Many species of Begonia are cultivated in gardens. Most have been introduced from South America and the West Indies. There are twelve wild species in the Presidency some of which are cultivated in Madras gardens.

Cactaceae

Fleshy-stemmed plants. Leaves represented by spines or small tubercles. Flowers standing singly. Calyx-tube adherent to the ovary. Petals many. Stamens very many. Ovary 1-celled, containing many ovules. Fruit a berry.

The cactuses are natives of America but many have been introduced into this country where they have become completely naturalized.

Stems cylindrical, deeply ridged, not jointed	...	...	...	Cereus.
Stems flat, not ridged, jointed...	...	...	...	Opuntia.

Cereus, Mill.

Stems upright and tall, sometimes low and prostrate. Branches deeply angled or ribbed. Edges spiny. Flowers large, opening during night.

Cereus hexagonus, Linn.

சதுரக்கள்ளி மூஞ்சு

Plant branching near the base, rising up to 10 ft. in height. Branches erect, usually 6-angled. Spines 8-10 in a cluster. Flowers large, white, appearing along the edges of branches. Style green. Flowers in July and August. A native of the West Indies. It is often grown as a hedge.

Opuntia. The Prickly Pears.

நாகதாளி நங்கம்மூ

Small scale-like leaves present on young segments; these fall away very soon, spines taking their place on older segments.

- | | |
|---|-----------------|
| 1 Stamens protruding beyond the petals; flowers rose-red; | |
| spines absent | coccinellifera. |
| Stamens not protruding beyond the petals | 2 |
| 2 Spines 1 or 2 developing in each tuft | vulgaris. |
| Several spines developing in each tuft | 3 |
| 3 Spines all straight; flowers lemon-yellow changing to rose- | |
| pink | elator. |
| Spines mostly curved, the largest in each tuft stout, | |
| horn-coloured; flowers yellow, not fading to rose-pink | Dillenii. |

Opuntia coccinellifera, Mill.

Segments dark green, obovate, spineless, the spines having fallen away quite early. Flowers very showy, rose-red, appearing on the top of the segments. Sepals scarlet. Stamens pink, standing out beyond the petals. Fruit red. Flowers at various parts of the year but specially after the rains.

A Mexican species first introduced at Masulipatam at the end of the eighteenth century as a food plant for the cochineal insect. This industry has ceased to exist in

South India since the introduction of aniline dyes. The plant has run wild at Ennur on the railway line on the northern side of the bridge. Also at Guindy Park. The original name of the plant, *Nopalea cochinilifera*, Linn., has been restored in some recent publications.

Opuntia vulgaris, Mill. (*Opuntia monocantha*, Haw.)

Sections of stem obovate, dark green. Spines 1 or 2, sometimes more at each point, straight, whitish, tips somewhat horn-coloured. Stamens and style long. Sepals with a red stripe down the middle. Petals golden-yellow. Fruit reddish-purple. Flowers at various parts of the year.

Occasionally found run wild, but not very common. Introduced from Brazil probably towards the end of the eighteenth century. Nungumbakam, behind "Torfels". Mylapore, behind Ramakrishna Mission School.

Opuntia elatior, Mill.

Stems tall and much-branched. Segments of stem obovate, pale green. Spines dark-coloured. Flowers dark yellow fading to pink. Stamens and style rather short. Filaments pink. Fruit red. Flowers in the rainy and cold weather.

This species and the next are the most common among the *Opuntias* found in our area. This grows to a greater height than the next. Introduced about the year 1800. Extensively used for hedging.

Opuntia Dillenii, Haw. The Common Prickly Pear

Pl. XIV, A.

Stems growing in broad clumps and often forming dense thickets. Segments obovate, whitish-green. Surface very uneven. Spines not straight, the stoutest one in each tuft the most curved, horn-coloured. Flowers yellow. Fruit purple. Flowers all through the year.

This species has become a pest all over the Presidency, and, being very tenacious of life, is very difficult to eradicate. It came from the Californian Peninsula and seems to have been the first among the prickly pears to be introduced into this country. Its spread is much encouraged by its being used for hedges. In February 1922 a sand bank was formed on the backwater at Ennur quite close to the sea. This species was found to be among the first of the plant-colonists.

Aizoaceae

Herbs, erect or prostrate. Leaves alternate, opposite or whorled. Stipules absent. Flowers in cymes or clusters. Sepals 4 or 5. Petals absent. Stamens few or many. Ovary 1- to 5-celled, with 1 to many ovules in each cell or sometimes consisting of 2-5 separate carpels each with 1 ovule. Fruit breaking open by the top portion coming off

Trianthema decandra, Linn.

வெள்ளைசாறுவேளை நெல்லுக்கீர

A prostrate herb with long glabrous stems. Leaves elliptic or elliptic-oblong, apex rounded and with a minute triangular point, glabrous, midrib prominent, $\frac{3}{4}$ -1½ in. long. Flowers in dense umbel-like clusters in the axils of leaves. Inner side of the calyx white. Stamens 10 or 15, red. Ovary 2-celled, red. Capsule 4-seeded, not enclosed in the calyx-tube, the upper part coming off with 2 seeds. Flowers October to March.

A weed of grassy places.

Trianthema Portulacastrum, Linn. (*Trianthema monogyna*, Linn.)

மூக்கமட்டை Pl. XIV, C. கடுக்கீர

A prostrate, somewhat fleshy, much-branched herb. Leaves broadly obovate, glabrous, the larger one of each pair placed slightly higher up than the smaller one, the larger ones $\frac{3}{4}$ -½ in. long, the smaller ones $\frac{3}{8}$ -½ in. long. Petiole expanded into a sheath at its base. Flowers not stalked, standing singly inside the sheath of the petiole. Calyx-lobes ovate, acute, pinkish. Stamens 10-20. Anthers pinkish. Ovary truncate. Fruit with 2 spreading teeth, the upper part coming off with 1 seed, the lower part containing 3-5 seeds. Flowers July to March.

A common weed of waste places.

Trianthema triquetra, Rottl. (*Trianthema crystallina*, Wt. & Arn.)

A small, spreading, much-branched herb with a thick and woody underground stock. Branches slender, reddish, prostrate, the younger parts more or less 3-sided. Leaves linear, fleshy, more or less covered with crystalline protuberances, $\frac{1}{2}$ in. long. Flowers many, crowded in the axils of leaves, not stalked. Stamens 5. Anthers purple. Styles single. Fruit enclosed in the calyx-tube, with a circular depression at the top, 2-seeded, the upper part coming off with 1 seed. Flowers in November and December.

A weed of waste places.

Mollugo, Linn.

Branching herbs. Leaves whorled or alternate or spreading on the ground as a tuft. Stipules thin, falling away. Flowers in cymes, racemes or clusters. Sepals 5, remaining on the fruit. Stamens 3-5, alternating with the sepals and arising from below the ovary. Capsule 3-celled, breaking open along the back. Seeds many.

- | | | |
|---|---|----------------|
| 1 | Flowers in the axils of leaves; seeds with a slender white thread curled round them | oppositifolia. |
| | Flowers at the ends of branches; no thread present round the seeds | 2 |
| 2 | Stem leafless except at the very base where there is a tuft of leaves spread on the ground | nudicaulis. |
| | Stem leafy | 3 |

- 3 Cymes lengthening and becoming raceme-like; flowers on short stalks; leaves linear-lanceolate disticha.
 Cymes branched as in a corymb; flowers on long slender stalks 4
 4 Leaves obovate to lanceolate; seeds covered with tubercles ... pentaphylla.
 Leaves linear; seeds not covered with tubercles; stems very slender Cerviana.

Mollugo oppositifolia, Linn. (*Mollugo spargula*, Linn.)

A slender prostrate branching herb. Leaves oblanceolate to spatula-shaped, unequal, $\frac{1}{2}$ - $\frac{3}{4}$ in. long; whorls of leaves on one side of stem and on both sides alternately. Flowers white, clustered in the axils of leaves. Stamens 5 or more, alternating with 2-branched structures that represent sterile stamens. Styles 3, very short. Capsules 3-celled. Seeds very numerous, covered with tubercles and having a slender white thread round them. Flowers July to January.

Very common on waste ground.

Mollugo nudicaulis, Lamk.

బాగ్‌బాగ్‌లకు పర్వాటకము

An annual herb. Leaves elliptical, narrowing towards the base, glabrous, 1-2 in. long. Flower-bearing shoots many, branching trichotomously. Flowers small, on slender stalks. Stamens 5. Styles 3, short. Seeds reddish-black, covered with minute flattened tubercles. Flowers August to January.

In all kinds of open situations.

Mollugo disticha, Ser.

A spreading prostrate herb with many stems arising from the base. Leaves linear-lanceolate, $\frac{1}{2}$ - $1\frac{1}{4}$ in. long. Flowers arranged on an elongated branching axis, pure white. Stamens 5. Styles 3, short. Seeds not covered with tubercles. Flowers August to January.

In sandy places.

Mollugo pentaphylla, Linn. (*Mollugo stricta*, Linn.)

An erect herb 6-12 in. high. Leaves in whorls of 2-9, obovate to spatula-shaped, narrowed at the base, $\frac{3}{4}$ - $1\frac{1}{2}$ in. long. Flowers white, in loose cymes at the ends of branches. Flower-stalks slender. Stamens 3-5. Styles 3, short. Seeds covered with tubercles. Flowers September to January.

A weed of waste places.

Mollugo Cerviana, Ser.

Pl. XIV, D.

An erect slender annual. Stems many, filament-like, often reddish, arising from the base and standing out stiffly in an umbel-like manner, 3-6 in. high. Leaves forming a tuft at the base of the stem, linear to spatula-shaped, $\frac{1}{4}$ - $\frac{1}{2}$ in. long; those on the branches 2-8 in each whorl, very narrow, $\frac{1}{4}$ - $\frac{3}{4}$ in. long. Flowers numerous, on long thin stalks, arranged in threes in the form of an umbel in the axils of leaves or at the ends of branches. Stamens 5. Styles 3, very short. Seeds numerous, smooth. Flowers September to February.

In dry or sandy places.

Gisekia, Linn.

Prostrate spreading annuals. Leaves somewhat fleshy. Flowers clustered in the axils of leaves. Sepals 5. Stamens 5. Filaments dilated below. Ovary consisting of 5 independent carpels each containing 1 ovule. Styles as many as the carpels. Fruit of 5 1-seeded units, not splitting.

Gisekia pharnaceoides, Linn.

மணல்கீரை

ఇసుక దారికూర

A somewhat fleshy glabrous herb. Branches prostrate. Leaves elliptic-oblong or spatula-shaped, tapering at the base, whitish, $\frac{1}{2}$ - $1\frac{1}{2}$ in. long. Flowers numerous, greenish, on short stalks. Carpels surrounded by the sepals. Seeds black, with scattered white glandular prominences. Flowers August to January.

On waste lands. The leaves are edible.

Umbelliferae

Herbs. Leaves alternate, generally compound, the leaf-stalks expanded or forming a sheath at base. Flowers small, in simple or compound umbels. Calyx entire or 5-toothed, the tube wholly adhering to the 2-celled and 2-ovuled ovary. Petals and stamens 5 each, inserted on the disk that crowns the ovary and surrounds the base of the 2 styles. Fruit consisting of 2 dry seed-like carpels cohering by their inner faces and separating from each other when ripe. Carpels marked lengthwise with 5-9 ribs.

Centella, Linn.

Creeping herbs. Leaves simple, ovate. Calyx-teeth practically absent. Petals minute, white, overlapping in bud. Carpels 7- to 9-ribbed.

Centella asiatica, Urban. (Hydrocotyle asiatica, Linn.)

வல்லாரை

Pl. XIV, E.

చండూక బిల్వ

A trailing herb rooting at the nodes. Leaves several at each node, circular, broadly cordate at base, rather broader than long, shallowly crenate, glabrous, $\frac{1}{2}$ - $2\frac{1}{2}$ in. long.

Leaf-stalks channelled, 3-6 in. long. Flowers in clusters of umbels, each umbel consisting of 3 or 4 small flowers not carried on stalks. The stalk of the umbel about $\frac{1}{2}$ in. long. Fruit $\frac{1}{6}$ in. long, longer than broad. Flowers November to March.

In moist situations as borders of rice fields and water channels. The plant is extensively employed in Indian medicine.

The following plants are occasionally found as weeds :—

Foeniculum vulgare, Gaertn. Fennel

A glabrous herb. Leaves 3 or 4 times compound and having linear ultimate segments, with a strong smell when crushed. Flowers small, having yellow petals turned backwards and divided into 2 parts at the top. Flowers in March.

Anethum Sowa, Roxb. Dill

A glabrous herb. Leaves 2 or 3 times pinnately compound and having the ultimate segments linear. Flowers in many-flowered umbels, yellow, carried on stalks about $\frac{1}{2}$ in. long. Fruit disk-shaped, 2-3 times as broad as thick, plano-convex.

Coriandrum sativum, Linn. Coriander

கொத்துமல்லி சூதுமி

Cultivated for its leaves which are much used for culinary purposes. Often found run wild.

Alangiaceae

Trees or shrubs. Leaves alternate, without stipules, two halves usually unequal at base. Flowers white or yellowish-white. Calyx-tube adherent to the ovary; limb truncate or 4- to 10-toothed. Petals 4-10. Stamens as many as the petals or 2-4 times as many. Ovary inferior, 1- or 2-celled, top-shaped. Fruit a 1- or 2-seeded berry.

Alangium, Lamk.

Stamens 2-4 times as many as the petals. Ovary 1-celled. Ovules single. Berry crowned by the calyx-limb.

Alangium salvifolium, Wang. (*Alangium Lamarckii*, Thw.)

அழிஞ்சில் Pl. XIV, F கண்டுக

A small deciduous tree with or without spines. Younger branches, leaf-stalks, flower-stalks, calyx-tubes and the outside of petals coated with soft woolly hairs. Leaves narrowly oblong, pointed or blunt at apex, 3-nerved, glabrous above, softly hairy on the nerves below, 3-6 in. long. Flowers clustered in the axils of leaves. Calyx-limb 5- to 10-toothed. Petals 5-10, nearly $\frac{3}{4}$ in. long. Stamens 20-30. Style cylindrical. Stigma large, round. Berry ovoid, up to $\frac{3}{4}$ in. long. Flowers January to March.

In dry places near Madras. Guindy Park. Pallavaram. Vandalur. Avadi. The fruit is edible.

SYMPETALEAE

Rubiaceae

Herbs, shrubs or trees. Leaves opposite or whorled. Stipules interposed between the leaves, apparently absent when the leaves are whorled. Calyx-tube adherent to the ovary. Corolla with 4 or 5 lobes. Stamens as many as the corolla-lobes, inserted at the mouth or in the tube. Ovary inferior, 2- to 10-celled. Ovules 1 or more in each cell. Fruits of various types.

1	Ovules numerous in each cell	...	...	...	...	...	2
	Ovules 2 in each cell	...	...	...	...	...	6
2	Ovary 1-celled	...	...	...	...	...	Gardenia, p.142.
	Ovary more than 1-celled	...	...	...	...	...	3
3	Corolla-lobes toothed on each side	...	...	...	...	...	Dentella, p.143.
	Corolla-lobes entire	...	...	...	...	...	4
4	Fruit a capsule; corolla-lobes valvate	...	...	...	...	...	Oldenlandia, p.143.
	Fruit a fleshy berry; corolla-lobes twisted in the bud	...	...	...	...	...	5
5	Flowers at the ends of branches	...	...	...	...	...	Chomelia, p.145.
	Flowers in the axils of leaves and at the ends of branches	...	...	...	...	...	Randia, p.145.
6	Corolla-lobes twisted in the bud	...	...	...	...	...	7
	Corolla-lobes valvate	...	...	...	...	...	8
7	Leaves thick; style 2-branched or tending to be so; bracts leathery	...	...	...	...	...	Ixora, p.146.
	Leaves thin; style entire; bracts quite thin	...	...	...	...	...	Pavetta, p.147.
8	Shrubs or trees	...	...	...	...	...	9
	Herbs	...	...	...	...	...	10
9	Fruit a single drupe	...	...	...	...	...	Plectronia, p.147.
	Fruit formed by the union of a number of fleshy calyces	...	...	...	...	...	Morinda, p.147.
10	Seaside herbs; leaves fleshy; fruit large	...	...	...	...	...	Hydrophylax, p.148.
	Not seaside herbs; leaves not fleshy; fruit small	...	...	...	...	...	Borreria, p.148.

Gardenia, Linn.

Trees or large shrubs. Stipules between the petioles. Flowers usually white, changing to yellow. Corolla-lobes 5, overlapping in bud. Filaments very short. Ovules numerous. Style thick. Stigma club-shaped, usually 2-branched. Fruit a berry.

Gardenia lucida, Roxb.

A small tree or a large shrub. Leaves elliptic-oblong, glabrous, shiny, $2\frac{1}{2}$ -6 in. long. Flowers fragrant, standing singly in the axils of leaves. Corolla large, at first white, soon turning yellow; tubular part about $1\frac{1}{2}$ in. long; lobes over 1 in. long. Fruit an ellipsoid berry about $\frac{3}{4}$ in. in diameter.

This species has been included on the authority of Mr. Fischer who says that it occurs in dry forests from sea-level to 2,000 ft.

Dentella, Forst.

A small prostrate herb. Leaves small. Flowers very small, standing singly in the axils of leaves. Corolla-lobes 5. Ovary 2-celled. Ovules many. Fruit small, dry, not splitting.

Dentella repens, Forst.

A slender prostrate rooting herb with dichotomous branches. Leaves very small, rounded at the apex and gradually narrowing towards the base, or lanceolate, about $\frac{1}{4}$ in. long. Flowers in the forks of branches, almost stalkless. Corolla white; lobes 3-toothed. Stigmas 2, filament-like. Capsules very small, densely covered with coarse hairs and crowned by the calyx-limb. Flowers July to August.

In moist places. Not very common.

Oldenlandia, Plum.

Low herbs with small stipules united to the petioles. Calyx 4-lobed. Corolla short, valvate in the bud. Stigmas 2. Pod thin, 2-celled, opening along the back and across the top.

- | | | | | | | |
|--|-----|-----|-----|-----|-----|--------------|
| 1 Capsule 4-angled or -winged | ... | ... | ... | ... | ... | 2 |
| Capsule neither angled nor winged | ... | ... | ... | ... | ... | 3 |
| 2 Capsule 4-angled; flowers in racemose panicles; calyx-lobes short | ... | ... | ... | ... | ... | biflora. |
| Capsule 4-winged; flowers in cymose heads; calyx-lobes broad and much produced | ... | ... | ... | ... | ... | alata. |
| 3 Flowers 1, 2 or at the most 3 together on a main flower-stalk | ... | ... | ... | ... | ... | 4 |
| Flowers many together arranged in umbels or cymes | ... | ... | ... | ... | ... | 6 |
| 4 Leaves elliptic or elliptic-lanceolate; bases of calyx-teeth touching in fruit | ... | ... | ... | ... | ... | crystallina. |
| Leaves linear; bases of calyx-teeth not touching in fruit | ... | ... | ... | ... | ... | 5 |
| 5 Flowers stalked, usually 2 or 3 together | ... | ... | ... | ... | ... | corymbosa. |
| Flowers not stalked or on minute stalks, standing singly in the axils | .. | ... | ... | ... | ... | diffusa. |

- 6 Flowers in umbels; margins of leaves not curved back ... umbellata.
 Flowers not in umbels; margins of leaves curved back ... 7
- 7 Flowers in long, slender, branching, raceme-like cymes; leaves
 glabrous stricta.
 Flowers in short close cymes; leaves covered with coarse
 hairs Shuteri.

Oldenlandia biflora, Linn. (*Oldenlandia paniculata*, Burm.)

An erect or spreading, glabrous, annual herb. Leaves elliptic-ovate or oblong, slightly acute at apex, bright green, narrowing into the stalk, soft, nerves indistinct, $\frac{1}{2}$ -3 in. long. Cymes in the axils of upper leaves, 3- to 8-flowered. Flowers minute, white. Flowers September to February.

A very variable and common weed.

Oldenlandia alata, Koen.

A small, somewhat succulent, annual herb, 6-12 in. high. Leaves nearly stalkless, elliptic-lanceolate, about $\frac{3}{4}$ in. long. Flowers collected in cymose heads in the axils of leaves, white. Calyx-lobes broad and much produced. Fruit having 4 wings, $\frac{1}{3}$ in. long. Flowers in October and November.

Ennur, in wet places on the northern side of the bridge.

Oldenlandia crystallina, Roxb.

A small prostrate herb. Leaves elliptic or elliptic-lanceolate, nearly $\frac{3}{4}$ in. long. Flowers usually 2 together. Calyx-teeth fairly large. Corolla white, short. Capsule $\frac{1}{6}$ in. long. Flowers in the rainy weather.

A not very common weed.

Oldenlandia corymbosa, Linn.

An annual herb. Stems many. Leaves linear or linear-lanceolate, acute at apex, $\frac{3}{4}$ -1 $\frac{1}{4}$ in. long. Stipules short with a few bristles. Flowers on very slender stalks, 2 or 3 together. Corolla white. Capsules globose. Flowers October to December.

A very common weed at Guindy Park, Ennur, Pallavaram and Vandalur.

Oldenlandia diffusa, Roxb.

A glabrous prostrate annual herb. Stems numerous, often rooting at the nodes. Leaves nearly stalkless, linear or linear-lanceolate, acute at apex, $\frac{3}{4}$ -1 $\frac{1}{4}$ in. long. Flowers usually one in each axil. Calyx-teeth long. Capsule larger than in the last species, broader than long. Flowers in the rainy weather.

Not very common.

Oldenlandia umbellata, Linn.

சாயவேர் Pl. XV, A. சிவபேரூ

An annual herb. Stem much-branched and somewhat woody at the base. Leaves numerous, often collected together, linear, acute at apex, $\frac{1}{2}$ -1 in. long. Flowers 3-10, in small umbel-like cymes in the axils of leaves. Corolla bluish. Capsule globose. Flowers in all seasons but the driest.

One of the commonest weeds. The root of this plant, known in commerce as "Chay-root", yields a permanent red dye.

Oldenlandia stricta, Linn.

A tall wiry annual herb repeatedly branched from the base. Leaves linear-lanceolate, thin, glabrous, 1 in. or more in length. Flowers arranged in raceme-like cymes at the ends of branches. Calyx-teeth narrow. Corolla-tube funnel-shaped. Capsules obovoid, carried on stalks. Flowers in October and November.

In sandy places near the sea. Ennur. Covelong.

Oldenlandia Shuteri, Hook.

A fairly tall, branching herb. Branches stouter and more sparingly divided than in the last species. Leaves linear-lanceolate, covered with rough hairs above, margins curved backwards, thicker than in the last species, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Cymes close, often so much so as to appear like heads. Calyx-lobes narrow. Corolla blue; tube cylindrical. Fruit ovoid, stalked. Flowers in November.

Ennur. This species has not been recorded as occurring anywhere else than the city of Madras.

Chomelia, Linn.

Shrubs, the younger parts often covered with resin. Flowers white, in cymose corymbs at the ends of branches. Corolla-lobes 5, overlapping in bud. Ovary 2-celled. Ovules many in each cell. Fruit a small, round berry.

Chomelia asiatic, O. Kze. (*Webera corymbosa*, Willd.)

சொழி

An evergreen shrub. Leaves oblong-lanceolate, leathery, shiny above, 3-6 in. long. Flowers white, scented. Fruit black, about $\frac{1}{4}$ in. in diameter. Flowers March to July.

Avadi. Vandalur.

Randia, Linn.

Shrubs or trees usually armed with spines. Leaves in pairs, one of each pair often arrested in growth. Lobes of corolla 5, twisted in bud, afterwards spreading. Ovary 2-celled. Ovules numerous. Fruit a berry.

Flowers 1 or 2 at the ends of branches; seeds embedded
in pulp... .. dumatorium.

Flowers in umbel-like corymbs in the axils of leaves; seeds
not embedded in pulp malabarica.

Randia dumatorium, Lamk.

மருக்காரை மூலம்

A large shrub with spines arranged oppositely. Leaves obovate, 1-1½ in. long. Flowers standing singly at the ends of short leafy branches. Corolla at first white, afterwards becoming yellowish, ¾ in. long. Fruit a round berry, smooth, yellowish, about ¾ in. in diameter. Flowers February to September.

Guindy Park. Avadi. Vandalur.

Randia malabarica, Lamk.

An erect shrub armed with spines. Leaves oblong-lanceolate, glabrous, leathery, 1½-2½ in. long. Flowers in cymes opposite to the leaves. Corolla scented, white fading to yellow, a little less than ¾ in. long. Fruit dark red or black, about ½ in. in diameter. Flowers February to August.

Guindy Park. Avadi. Vandalur.

Ixora, Linn.

Shrubs or small trees. Flowers in branched corymb-like cymes at the ends of branches. Corolla with a long slender tube and 4 spreading lobes. Ovary 2-celled. Ovules 1 in each cell. Stigma 2-branched.

Flowers white; corolla-tube less than ½ in. long parviflora.

Flowers scarlet; corolla-tube 1-1½ in. long coccinia.

Ixora parviflora, Vahl.

சுருந்தகோரை மூலம்

A small evergreen tree. Leaves on minute stalks, oblong or elliptic, glabrous, shiny above, leathery, 3-5 in. long. Flowers white, strongly scented. Fruit black, rounded, ½ in. in diameter. Flowers February to June.

Vandalur. Occasionally planted in gardens. The green branches are said to be used for torches and hence this tree is known as the Torch Tree.

Ixora coccinia, Linn. Scarlet *Ixora*

தச்சி

A small shrub. Leaves oblong, almost sessile, leathery, glabrous, 2-4 in. long. Flowers bright scarlet, in corymb-like cymes. Corolla-tube 1½ in. long; lobes ½ in. long. Flowers almost all through the year.

A native of the West Coast often grown in gardens.

Pavetta, Linn.

Shrubs. Leaves opposite, thin. Flowers in dichotomously-branched, corymb-like cymes. Corolla-lobes 4, twisted in bud, spreading in flower. Ovary 2-celled. Style long, much drawn out. Ovules one in each cell. Fruit a small fleshy berry.

Pavetta indica, Linn.

பாவட்டன்

Pl. XV, B.

பாபட

A shrub 2-4 ft. high. Leaves elliptic-oblong or elliptic-lanceolate, glabrous, thin, 3-6 in. long. Flowers white, scented, in corymb-like cymes at the ends of branches. Corolla about $\frac{3}{4}$ in. long. Fruit round, black, smooth, about $\frac{1}{4}$ in. in diameter. Flowers August to October.

In the undergrowth of jungle at Avadi and Vandalur and also in jungly places near the city.

Plectronia, Linn.

Trees or shrubs, spiny or not. Flowers small. Corolla-lobes valvate in bud. Ovary 2-celled. Ovules one in each cell. Fruit a drupe, sometimes 1-celled owing to the suppression of one of the carpels.

A small evergreen tree, not thorny; leaves shiny... didyma.

A thorny shrub; leaves not shiny... parviflora.

Plectronia didyma, Kurz (Canthium didymum, Gaertn.)

A small evergreen tree. Leaves ovate-lanceolate or oblong-lanceolate, leathery, glabrous, glossy above, 2-3 in. long. Flowers in cymes in the axils of leaves, white, scented, $\frac{1}{4}$ in. long. Fruit a round berry, about $\frac{1}{4}$ in. in diameter. Flowers January to July.

Avadi. Vandalur.

Plectronia parviflora, Bedd. (Canthium parviflorum, Lamk.)

காளை

பலக

A thorny shrub. Leaves ovate, obovate or sometimes circular, glabrous, whitish below, $\frac{3}{4}$ -1 $\frac{1}{2}$ in. long. Flowers white, arranged in cymes in the axils of leaves. Corolla 4-lobed. Fruit round, compressed, yellow when ripe, edible. Flowers May to September.

Very common in scrub jungle.

Morinda, Linn.

Trees or shrubs. Stipules sheathing the stem. Flowers collected together into heads and arranged as in an umbel, their calyces more or less coherent. Corolla-lobes valvate in bud. Fruit composite and formed by the union of the enlarged fleshy calyces.

Morinda citrifolia, Linn.

நாணை Pl. XV, C. మద్ది, మాలుగుచెట్టు

A small tree with 4-angled branches. Leaves broadly elliptic, bright green, glabrous, shiny, 5-8 in. long. Flowers white, scented, arranged in dense ovoid heads, over 1 in. long. Corolla-lobes 5. Fruit smooth and glossy. Flowers May to September.

A very common tree. Occurs wild near the city and is often planted.

Hydrophylax, Linn.

Succulent herbs rooting at the nodes. Leaves without stalks. Stipules forming a sheath round the stem. Flowers standing singly in the axils of leaves. Corolla 4-lobed, funnel-shaped, with a ring of hairs within. Ovary 2-celled, with one ovule in each cell. Fruit large, corky, compressed.

Hydrophylax maritima, Linn.

Pl. XV, D.

A succulent herb. Stems numerous, prostrate, stout, glabrous. Leaves obovate-oblong or ovate-oblong, smooth, fleshy, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Flowers standing singly in the axils of leaves. Calyx $\frac{1}{2}$ in. long. Corolla lilac, $\frac{1}{2}$ in. long. Fruit tapering at both ends, $\frac{1}{2}$ - $\frac{2}{3}$ in. long. Flowers in the rainy weather and after.

Abundant on sand along the coast. This is a very good sand-binder.

Borreria, G.F.W. Mey. (Spermacoce, Linn.)

Herbs with 4-angled branches. Stipules forming a tube with bristly margins. Flowers small. Corolla with 4 valvate lobes. Ovary 2-celled with one ovule in each cell. Capsule small, crowned by the calyx, consisting of 2 hard 1-seeded parts which open along their inner faces.

An erect herb stricta.

A trailing herb hispida.

Borreria stricta, K. Sch. (Spermacoce stricta, Linn.)

An erect herb. Leaves almost stalkless, elliptic-lanceolate or linear-oblong, more or less covered with rough hairs on both sides, 1-2 in. long. Flowers in dense heads surrounded by a whorl of 2-6 leaves. Corolla white, with a short tube. Capsule thin, narrow, $\frac{1}{8}$ in. long. Flowers in December and January.

Adyar, not very common.

Borreria hispida, K. Sch. (Spermacoce hispida, Linn.)

நத்தைதச்சூரி

మదనఘంట

A trailing herb covered with bristly hairs. Leaves not stalked, oblong, hairy, $\frac{1}{2}$ -2 in. long. Flowers 4-6 in a whorl, enclosed in the stipular cup. Corolla pale blue; tube longer than in the last species. Capsule small, globose, hard. Flowers during rainy weather and after.

A very common weed in open fields.

Compositae.

Herbs or shrubs. Flowers arranged in a close head of many florets on the dilated top of a common peduncle (receptacle) and surrounded by an involucre of bracts. Calyx-tube in each floret united with the 1-celled inferior ovary and with the lobes modified into hairs or scales or entirely absent. Corolla either strap-shaped or tubular. The flowers with a strap-shaped corolla are called rays or ray-florets. The tubular flowers compose the disk. In the latter the corolla is 5-lobed and valvate in bud. Stamens 5, inserted on the corolla, their anthers united into a tube. Style 2-cleft at the apex. Fruit seed-like, dry, containing a single erect seed (achene). This is the largest family of flowering plants.

- | | | | | | |
|----|--|-----|-----|-----|------------------------|
| 1 | Plants abounding in milky or yellow juice | ... | ... | ... | 2 |
| | Plants without milky or yellow juice | ... | ... | ... | 3 |
| 2 | Juice milky; achenes beaked; corolla bluish | ... | ... | ... | Lactuca, p.150. |
| | Juice yellow; achenes not beaked; corolla yellow | ... | ... | ... | Launaea, p.151. |
| 3 | Flowers yellow | ... | ... | ... | 4 |
| | Flowers not yellow | ... | ... | ... | 14 |
| 4 | Flowers pale yellow; bracts of involucre spine-pointed | ... | ... | ... | Dicoma, p.151. |
| | Flowers bright yellow; bracts of involucre not spine-pointed | ... | ... | ... | 5 |
| 5 | Leaves opposite | ... | ... | ... | 6 |
| | Leaves alternate | ... | ... | ... | 9 |
| 6 | Pappus absent | ... | ... | ... | 7 |
| | Pappus present | ... | ... | ... | 8 |
| 7 | Achenes armed with a pair of horn-like spines | ... | ... | ... | Acanthospermum, p.151. |
| | Achenes not armed with horn-like spines | ... | ... | ... | Flaveria, p.152. |
| 8 | Pappus of two slender awns | ... | ... | ... | Synedrella, p.152. |
| | Pappus copious and feathery | ... | ... | ... | Tridax, p.153. |
| 9 | Achenes only 2 to each flower-head | ... | ... | ... | Xanthium, p.153. |
| | Achenes many to each flower-head | ... | ... | ... | 10 |
| 10 | Ray-florets present | ... | ... | ... | 11 |
| | Ray-florets not present | ... | ... | ... | 12 |
| 11 | Stems prostrate | ... | ... | ... | Grangea, p.154. |
| | Stems erect | ... | ... | ... | Vicoa, p.154. |
| 12 | Pappus absent | ... | ... | ... | Epaltes, p.154. |
| | Pappus present | ... | ... | ... | 13 |
| 13 | Anther-bases with tails | ... | ... | ... | Blumea, p.155. |
| | Anther-bases without tails | ... | ... | ... | Laggera, p.156. |

14	Leaves opposite	...	...	...	...	...	...	15
	Leaves alternate	...	...	...	...	...	...	18
15	Ray-florets present	...	...	...	...	...	...	Eclipta, p.156.
	Ray-florets absent	...	...	...	...	...	...	16
16	Leaves strongly scented; upper leaves alternate	...	...	...	...	...	...	Ageratum, p.156.
	Leaves not scented or only faintly scented; upper leaves opposite	...	...	...	...	...	...	17
17	Pappus present	...	...	...	...	...	...	Eupatorium, p.157.
	Pappus absent; calyx represented by a minute cup	...	...	...	...	...	...	Lagasca, p.157.
18	Ray-florets present	...	...	...	...	...	...	Erigeron, p.157.
	Ray-florets absent	...	...	...	...	...	...	19
19	Pappus absent	...	...	...	...	...	...	Sphaeranthus, p.158.
	Pappus present	...	...	...	...	...	...	20
20	Pappus consisting of an inner and an outer series of hairs...	...	...	...	...	...	...	Vernonia, p. 158.
	Pappus consisting of only one series of hairs	...	...	...	...	...	...	21
21	Leaves pinnately cut, with a large and rounded terminal lobe and with the lower lobes small; bracts of involucre turned back when in seed; achenes 5-ribbed	...	...	...	...	...	...	Emilia, p.159.
	Leaves not pinnately cut as above; bracts of involucre not reflexed when in seed; achenes 10-ribbed	...	...	...	...	...	...	Centrathrum, p.159.

Lactuca, Linn.

Glabrous milky herbs. Leaves forming a rosette at the base of the stem and arranged alternately on the stem. Florets all having strap-shaped corollas. Pappus of many series of hairs.

Lactuca runcinata, DC.

Pl. XVII, E.

A tall glabrous herb 2-5 ft. high. Stem erect, hollow. Leaves not stalked, pinnately cut, thin, glabrous on both surfaces, 4-12 in. long; those forming the rosette fewer, narrower and stem-clasping. Heads cylindrical, arranged along the slender leafless branches, $\frac{1}{2}$ in. long. Flowers pinkish-white. Pappus soft, white, copious. Achenes dark brown, flattened, 3-ribbed on each side, the beak ending in a flattened disk. Flowers in April and May.

Museum compound.

Launaea, Cass.

Glabrous herbs. Leaves lobed or pinnately cut into segments. Florets all strap-shaped. Corolla 5-toothed at the apex. Pappus copious; hairs in many series.

Launaea pinnatifida, Cass.

A prostrate herb. Stem rooting and leaf-bearing at the nodes. Leaves oblong, pinnately cut or lobed at the margin, up to 3 in. long. Flower-heads standing singly or 2 together, arising from the nodes, up to $\frac{1}{2}$ in. long. Corolla yellow. Achenes obtusely 4-angled, $\frac{1}{3}$ in. long. Pappus soon falling, $\frac{1}{4}$ in. long. Flowers after the rains.

In sandy tracts near the sea. The plant is used in Indian medicine.

Dicoma, Cass.

Herbs. Leaves alternate. Flower-heads in the axils of the upper leaves or opposite the leaves, not stalked. Flowers all bisexual or the outer ones female. Bracts in many series. Anther-bases produced below the point of insertion. Achenes densely covered with silky hairs. Pappus hairs in many series.

Dicoma tomentosa, Cass.

An erect branching herb covered with white wooly hairs, 6-18 in. high. Leaves linear-obovate, clothed on both sides with cottony tomentum, not stalked, 1 in. long. Flower-heads numerous, at the ends of branches or opposite to the leaves. Involucral bracts ending in a spine. Corolla white or pale yellow. Pappus longer than the achene, the outer hairs somewhat shorter than the inner. Achenes densely clothed with long silky hairs. Flowers in February and March.

In dry fields.

Acanthospermum, Schrank.

Annual herbs. Leaves opposite. Flower-heads small, in the forks of the stem. Flowers yellow. Female flowers developing into fruit, with a strap-shaped corolla. Bisexual flowers not developing into fruit, with a 5-toothed corolla. Involucre in two series. Achenes spiny, with two long horn-like spines at the top. Pappus absent.

Acanthospermum hispidum, DC.

A hairy branching annual. Leaves obovate, gradually narrowing towards the base, serrate, not stalked, hairy on both surfaces, up to $1\frac{1}{4}$ in. long. Female flowers about 5, developing into achenes that stand radially. Achenes bristly and having a pair of horn-like spines at the top. Flowers in March.

A native of South America. This is one of most recently introduced weeds. It has just made its appearance in Madras. I found some specimens growing on the bank of the canal near the Central Station. It is established in South Kanara, Salem, and Malabar (Pallassana, Palghat).

Flaveria, Juss.

Herbs with opposite leaves. Flower-heads collected in dense clusters or compound heads surrounded by a few leafy bracts. The female flowers often single in the involucre, with a tubular corolla. Corolla of bisexual flowers 5-toothed. Pappus absent.

Leaves under $\frac{3}{4}$ in. broad	...	...	...	...	...	australasica.
Leaves 1-2 in. broad	...	...	...	...	...	contrayerba.

Flaveria australasica, Hook.

Pl. XVII, C.

An erect, rigid glabrous, pale green annual about 1 foot high, with opposite branches. Leaves linear-lanceolate, 3-nerved, with small remote teeth, the lower ones narrowing towards the base but sheathing the stem, the upper ones much dilated at the base, 1-2 in. long. Flower-heads numerous, in dense globose or hemispherical clusters surrounded by a few broad lanceolate floral-leaves, $\frac{1}{3}$ in. in diameter. The outer involucre of each cluster consisting of 2 or 3 narrow bracts enclosing a single female floret which has a 2-lobed corolla. The involucre in the centre enclosing 1 or more bisexual yellow flowers. Achenes flat, 10-ribbed. Flowers October to February.

A native of Australia fairly well established here. On the banks of the Buckingham Canal. Abundant in the People's Park.

Flaveria contrayerba, Pers.

An erect perfectly glabrous herb, stouter and taller than the preceding species. Leaves 3-nerved, lanceolate, margins toothed, apex acute, glabrous on both sides, under side greyish, 2-4 in. long. Floral-leaves narrower and flower-heads less compact than in the preceding species. Flowers in July.

This plant is a native of S. America. It is slowly becoming established in Madras and is often found together with *Flaveria australasica* from which it differs but little.

Synedrella, Gaertn.

A branched annual herb. Leaves opposite. Flower-heads with 1 or 2 series of ray-florets. Both ray-florets and bisexual florets developing into fruit. Inner bracts scale-like. Corolla yellow, that of ray-florets 3-lobed and that of bisexual florets 4-lobed. Pappus of 2 slender awns.

Synedrella nodiflora, Gaertn.

Pl. XVII, A.

An erect, dichotomously branching, glabrous herb. Leaves ovate-lanceolate, serrate, 3-nerved, rough, up to 4 in. long. Flower-heads in the axils of leaves and at the ends of branches, not stalked. Achenes of two very distinct forms; the outer ones winged and very spiny on the wings; the inner black, slender and rough. Flowers October to December.

A native of Mexico. This weed is thoroughly naturalized here and is frequently found on waste land.

Tridax, Linn.

Leaves opposite. Flower-heads consisting of rays and disk. Involucre bell-shaped. Corollas of female florets strap-shaped or 2-lipped; those of disk-florets tubular, 2-lipped. Anther-bases with short, acute prominences. Achenes silky. Pappus of feathery hairs.

Tridax procumbens, Linn.

Pl. XVII, B.

A straggling herb covered with rough hairs. Leaves ovate-elliptic, acute, deeply cut into teeth, hairy, 1-1¾ in. long. Flower-heads over ½ in. across, carried on very long stalks. Ray-florets strap-shaped, 3-lobed, yellow. Pappus of numerous feathery bristles. Flowers all through the year.

A native of Central America. One of the commonest weeds in gardens, road-sides and waste places.

Xanthium, Linn.

Annual herbs. Leaves alternate. Bisexual and female florets in different heads; the latter clustered on the lower parts of the plant and setting seed; the former in short spikes or racemes on the upper parts and not fructifying. Bracts enclosing bisexual florets few, small; those enclosing the female florets united together and bearing a pair of beaks. Achenes 2 to each head, enclosed in 2-beaked envelopes formed by the hardened involucre and covered with hooked spines. Pappus absent.

Xanthium strumarium, Linn.

A coarse annual plant. Leaves broadly triangular-ovate, nearly as broad as long, more or less 3-lobed, irregularly toothed, with cordate bases, hairy on both sides, 2-3 in. long. Flower-heads in the axils and at the ends of branches, the female heads less numerous than bisexual ones which latter do not set seed. Involucre of fertile heads ovoid when ripe, 2-celled with two erect beaks, thickly clothed with hooks, about ⅝ in. long. Achenes glabrous, ½ in. long. Flowers in December.

Occasional on rubbish heaps.

Grangea, Forsk.

Prostrate herbs. Leaves alternate, pinnately cut. Flower-heads devoid of ray-florets. Outer florets female and the inner ones bisexual. Corollas of female flowers thread-like. Pappus-hairs forming a tube with a fringed mouth.

Grangea maderaspatana, Poir.

மாசுபத்திரி Pl. XVI, C.

Stems many, prostrate, spreading from the centre, hairy. Leaves pinnately cut into 2-4 pairs of opposite lobes, coarsely serrate, hairy on both sides, 1-2½ in. long. Flower-heads 1 or 2 together, on short stalks opposite to the leaves. Flowers yellow. Flowers December to July.

In rice fields, dried bottoms of tanks and sandy places.

Vicoa, Cass.

Herbs with alternate leaves. Flower-heads having 1 or 2 series of florets. Both ray-florets and bisexual florets developing seed. Bracts in many series. Bases of anthers tailed. Pappus absent in ray-florets; a few slender hairs present in bisexual florets.

Vicoa indica, DC. (Vicoa auriculata, Cass.)

A slender erect herb 2-3 feet high. Stem slightly hairy, reddish. Leaves not stalked, oblong-lanceolate, acute, slightly serrate, hairy on both surfaces, with ear-like appendages at the base, 1-3 in. long. Flower-heads carried on slender stalks, having a row of ray-florets, over ½ in. long. Bracts of involucre many, linear. Flowers yellow. Corolla of ray-florets 3-toothed at apex. Pappus absent in ray-florets and scanty in bisexual florets. Flowers November to March.

On dry open ground and in jungly places.

Epaltes, Cass.

Herbs. Leaves alternate, extending along the stem below their point of insertion. The outer florets of the head female and developing seed; the inner ones bisexual and not developing seed. Bracts of involucre in many series. Female florets with thread-like corollas. Bases of anthers tailed. Pappus absent.

Epaltes divaricata, Cass.

A small glabrous annual. 3-8 in. high. Main stem erect, with numerous winged branches. Leaves not stalked, linear-oblong, sparsely toothed, narrowed at the base, obtuse at apex, glabrous, ¾-2¼ in. long. Flower-heads standing singly on winged branches, purple. Flowers January to March.

A very common weed in damp places.

Blumea, DC.

Aromatic herbs. Leaves alternate. Flower-heads not having ray-florets. Outer florets female, with thread-like corollas and inner ones bisexual with tubular corollas. Anther-bases with small slender tails. Pappus hairs slender, soon falling.

- 1 Flower-heads many; corolla purple Wightiana.
 Flower-heads standing singly or 2 together; corolla yellow ... 2
- 2 Leaves somewhat stem-clasping, all alternate; achenes not angled; involucre bracts tipped with long hairs; pappus pink amplexens.
 Leaves not stem-clasping, upper ones more or less opposite; achenes angled; involucre bracts not tipped with long hairs; pappus white bifoliata.

Blumea Wightiana, DC.

Pl. XVI, E.

An erect strong-smelling herb. Branches softly hairy. Leaves elliptic or obovate, the lower ones petioled, the upper almost stalkless, irregularly toothed, $1\frac{1}{4}$ -4 in. long. Flower-heads arranged in panicles at the ends of branches. Flowers purple. Corolla-lobes glandular. Achenes 4- or 5-angled, not ribbed, hairy. Pappus shorter than the bracts of involucre. Flowers January to March.

In waste places.

Blumea amplexens, DC.

A small annual herb. Leaves not stalked, more or less clasping the stem, elliptic-oblong, acute, sharply toothed, sometimes entire, sparsely hairy, $\frac{3}{4}$ -1 in. long. Flower-heads standing singly at the ends of branches. Bracts of involucre tipped with long hairs. Flowers yellow. Peduncles longer than the leaves. Achenes not angled or ribbed. Pappus pink. Flowers January to April.

In waste places. The stem varies in its hairiness. The common Madras form is sparsely hairy. In a form collected at Ennur the stem and leaves are densely hairy.

Blumea bifoliata, DC.

Pl. XVI, D.

An erect or semi-erect herb. Stem more or less hairy. Leaves not stalked, the 2 uppermost more or less opposite, elliptic-oblong, acute, slightly serrate, minutely hairy, 1-2 in. long. Flower-heads standing singly at the ends of branches. Bracts of involucre acuminate. Peduncles rather long. Flowers yellow. Achenes angled. Pappus white. Flowers November to February.

A common weed.

Laggera, Sch.-Bip.

Herbs. Leaves alternate. Flower-heads without ray-florets. The outer florets female, in many series and having thread-like corollas. Bisexual florets with tubular corollas. Pappus of one series of hairs.

Laggera aurita, Sch.-Bip.

Pl. XVI, F.

An erect scented herb 1-3 ft. high, with many ascending branches covered with sticky hairs. Leaves scented prolonged backwards at their base so as to form a slight wing on the stem which consists of 3 or 4 pairs of slender leaf-like structures, obovate or oblanceolate, toothed, covered with sticky hairs on both sides, the lower 2-4 in. long, the upper much smaller and often bract-like. Flower-heads arranged somewhat as in a corymb at the ends of branches, up to $\frac{1}{2}$ in. in diameter. Flowers pink. Pappus white. Achenes thinly hairy. Flowers in April and May.

In dry open situations. Abundant in the Museum compound. This herb makes its appearance at a time when most others disappear.

Eclipta, Linn.

Hairy annuals. Leaves opposite. Flower-heads having ray-florets that stand outside. The inner florets all bisexual. Bracts of involucre leafy, in 2 series; the outer ones broad, about 5 in number; the inner ones narrower, about 3. Pappus absent, but an obscure crown of 1 or 2 teeth present on the achene.

Eclipta alba, Hassk.

கரிசலாந்தண்ணி

Pl. XVI, H.

கொடிமேய

A rough annual herb. Stems erect or prostrate. Leaves not stalked, variable in breadth, oblong-lanceolate, slightly serrate, tapering at both ends, hairy on both sides, $\frac{1}{2}$ -3 in. long. Flower-heads standing singly at the ends of branches, up to $\frac{1}{3}$ in. in diameter. Ray-florets with white corollas, limbs not toothed. Tubular corollas 4-toothed. Pappus absent. Minute teeth occasionally present on the achene. Flowers almost all through the year.

A common weed. The plant is used in medicine.

Ageratum, Linn.

Strong-scented erect herbs. Leaves opposite, the upper ones sometimes alternate. Heads arranged corymbosely. Bracts linear, in 2 or 3 series. Corollas all tubular, equal, 5-cleft. Achenes 5-angled. Five scales present on achenes.

Ageratum conyzoides, Linn.

Pl. XVI, B.

An erect annual herb 1-3 ft. high. Stem more or less hairy. Leaves broadly ovate, crenate, more or less hairy on both sides, obtuse, 2-3 in. long. Flower-heads in corymbs at the ends of branches. Flowers white. Pappus of 5 stiff bristles. Achenes black. Flowers at all seasons but the driest.

One of the commonest weeds. It is very troublesome in gardens.

Eupatorium, Linn.

Herbs or shrubs. Leaves usually opposite. Flower-heads arranged in corymbs or panicles. Bracts of involucre scaly, arranged in 1, 2 or more imbricate series. Pappus of one series of hairs. Achenes angled, ribbed.

Eupatorium odoratum, Linn.

An erect shrub. Stem softly and minutely hairy. Leaves ovate-lanceolate, serrately and distantly toothed, acuminate, with 3 nerves starting from the base, upper surface sparsely hairy, under surface densely covered with minute hairs, up to $2\frac{3}{4}$ in. long. Flower-heads cylindrical, arranged in branching corymbs at the ends of branches, $\frac{1}{2}$ in. long. Corolla blue, sweet-scented. Flowers December to February.

A native of Tropical America. It was introduced for cultivation in gardens chiefly as an edging plant. It has now run wild in waste places near bungalows.

Lagasca, Cav.

Rigid herbs. Leaves opposite (the upper ones alternate). What appears to be a single flower-head is in fact a cluster of 1-flowered heads each enclosed by its tubular involucre, or consisting of 4 or 5 bracts united together, the whole flower-cluster being supported by bract-like leaves. Flowers all bisexual. Bases of anthers prolonged backwards. Pappus-hairs forming a fringed cup.

Lagasca mollis, Cav.

A slender herb covered with short soft hairs. Leaves ovate, crenate, hairy on both sides, with acuminate tip, 1-2 in. long. Corolla white. Flowers all the year round.

In waste places. A native of Central America thoroughly naturalized here.

Erigeron, Linn.

Annual herbs. Leaves alternate, not stalked. Flower-heads having a series of ray-florets on the outside. Bracts of involucre many, narrow. Between the bisexual florets and the ray-florets there are some female florets with thread-like corollas. Achenes 2-nerved. Pappus slender, feathery.

Erigeron asteroides, Roxb.

A coarse hairy annual herb 1-2 ft. high. A tuft of shortly-stalked leaves present at the base of the stem. The upper leaves not stalked, oblong or obovate-oblong, more or less clasping the stem by their expanded bases, markedly toothed, hairy on both sides, 1-2 in. long. Flower-heads few, on long stalks, $\frac{1}{4}$ - $\frac{1}{2}$ in. in diameter. Bracts of involucre in 1 or 2 series, narrow, much shorter than the pappus, bristle-pointed. Ray-florets in 1 or 2 rows, spreading and having bluish corollas. Bisexual florets having yellow corollas. Achenes yellowish. Flowers October to February.

A very common weed. Abundant in the Museum compound.

Sphaeranthus, Linn.

Annual herbs with spreading stems. Leaves alternate, toothed. Stems with leafy outgrowths along their whole lengths, these being the downward extensions of the leaves beneath their points of insertion. What appears to be a flower-head is not a single head but a number of flower-heads united together into a globose cluster. Individual heads small, with a few outer female florets having tubular corollas and inner bisexual florets. Bases of anthers prolonged backwards. Pappus absent.

Sphaeranthus indicus, Linn.

கொட்டைக்கரந்தை Pl. XVI, G. வீழ்ச்சு

An erect aromatic herb covered throughout with sticky hairs. Leafy outgrowths on the stem toothed. Leaves not stalked, obovate-oblong, narrowed at the base, apex rounded or somewhat acute, toothed, $\frac{3}{8}$ -2 in. long. Flower-heads compound, globose, ovoid, on winged stalks, nearly $\frac{1}{2}$ in. in diameter. Corolla purple. Flowers January to April.

In paddy fields and other damp places.

Vernonia, Schreb.

Herbs (elsewhere also shrubs and trees). Leaves simple, alternate. Flower-heads arranged as in a corymb. Bracts of involucre in many series. Flowers all bisexual. Anthers prolonged backwards. Pappus consisting of 2 series of hairs; the outer minute and bristly; the inner long and feathery.

Vernonia cinerea, Less.

Pl. XVI, A.

An erect annual herb $\frac{1}{2}$ -2 $\frac{1}{2}$ ft. high. Stem marked with longitudinal lines. Leaves variable in shape, broadly elliptic or lanceolate, with a sharp point at apex, irregularly toothed, shallowly crenate-serrate, slightly hairy on both sides, 1-2 in. long. Flower-heads small, arranged as in corymbs at the ends of branches. Corolla pinkish-white. Achenes hairy. Pappus white. Very abundant during the rainy weather and after.

One of the commonest weeds in gardens, roadsides and waste places.

Emilia, Cass.

Herbs. Leaves alternate, pinnately cut. Florets all bisexual. Bracts in one series, turned backwards in fruit. Achenes 5-ribbed. Pappus copious.

Emilia sonchifolia, DC.

Pl. XVII, D.

A glabrous herb, erect or spreading, variously branched, 1-1½ ft. high. Leaves very variable; the lower leaves pinnately cut, with the end lobe very much larger than the others, not stalked, toothed; the upper leaves clasping the stem and prolonged at the base, up to 5 in. long. Flower-heads arranged as in a corymb, ½ in. long. Corolla deep pink. Peduncles very slender, nodding when young. Flowers December to March.

A weed of waste places, roadsides and paddy fields.

Centratherum, Cass.

Herbs. Leaves alternate. Florets all bisexual. Bracts in many series. Corolla purple. Anthers with obtuse prolongations at their bases. Achenes 8- to 10-ribbed.

Centratherum anthelminticum, O. Kze. (*Vernonia anthelmintica*, Will.)

நீர்நொச்சி

சித்தவாலை

A large erect annual. Leaves lanceolate or elliptic-lanceolate, somewhat hairy on both surfaces, coarsely serrate at apex, 2-3½ in. long. Flower-heads arranged as in a corymb, ½-¾ in. in diameter. Pappus reddish. Achenes 10-ribbed, softly hairy. Flowers after the rains.

Not very common. The achenes are used in Indian medicine. The plant roasted in a room, or powdered and thrown about the floor is believed to expel fleas and hence it is popularly known as Purple Flea-bane.

The following species of this order are commonly grown in gardens:—

Helianthus annuus, Linn. The Sun-flower

சூரியகாந்தி

சூர்ய காந்த

A native of the western part of the United States of America.

Zinnia elegans, Jacq.

A native of South America.

Chrysanthemum indicum, Linn.

சிவந்தி

சேமந்தி

Believed to be a native of China and Japan.

Artemisia pallens, Wall.

மயிர்க்கொழுந்து பவனம்

A herb with very aromatic leaves. Leaves pinnately cut. Flower-heads small, arranged in leafy panicles, yellowish. Cultivated for its leaves which are used by Indian women for decorating the hair and also in worship in temples.

Tagetes erecta, Linn. The African Marigold

துருக்கசாமந்தி ஐந்தி

An erect annual herb 2 ft. high with erect branches. Leaves pinnately parted, appearing like compound leaves. Involucre deeply cup-shaped. Flowers large, bright yellow. A native of Mexico introduced into India by the Portuguese and now thoroughly naturalized.

Tagetes patula, Linn. The French Marigold

துருக்கசாமந்தி ஐந்தி

Very similar to the last but slightly smaller with spreading branches and smaller flowers. A native of Mexico.

Campanulaceae

Herbs (or shrubs). Leaves alternate. Calyx adherent to the ovary. Corolla usually 5-lobed. Stamens 5, usually free from the corolla (attached to the corolla in *Sphenoclea*). Ovary 2- to 5-celled. Ovules many. Fruit usually a capsule.

Sphenoclea, Gaertn.

An erect, glabrous marsh-herb. Flowers small, in dense spikes at the ends of branches or opposite to the leaves, each with one bract and 2 bracteoles. Stamens attached to the corolla. Ovary partially inferior, 2-celled. Capsule roundish, breaking open by the top coming off as a lid.

Sphenoclea zeylanica, Gaertn.

Pl. XV, E.

A marsh-herb 1-3 ft. high. Stem somewhat spongy. Leaves lanceolate-oblong, acute, glabrous, whitish-green, 1-3 in. long. Spikes at the ends of branches, $\frac{3}{4}$ -2 in. long. Peduncles up to 1 in. long. Flowers small, greenish-yellow. Corolla broadly bell-shaped, 5-lobed. Flowers December to March.

Common in swampy places. Kilpauk, near the water-works. On the edge of the pond in Guindy Park.

The corolla-lobes are imbricate and not valvate as described in Gamble's Flora of Madras Presidency and Hooker's Flora of British India.

Plumbaginaceae

Herbs. Leaves alternate. Calyx and corolla each with 5 lobes. Stamens 5, standing opposite to the lobes of corolla. Ovary 1-celled and having a single ovule. Styles 5 or divided into 5 branches.

Plumbago, Linn.

Herbs or small shrubs. Leaves clasping the stem. Flowers in spikes at the ends of branches. Calyx tubular, clothed with prominent stalked glands. Stamens not attached to the corolla but arising from beneath the ovary. Style with 5 branches. Capsule splitting by the top coming off.

Plumbago zeylanica, Linn.

சித்திரமூலம் Pl. XX, A. చిత్రమూలము

A rambling herb often tending to climb. Stem marked with longitudinal lines. Leaves thin, ovate, entire, slightly acute, glabrous, abruptly narrowed into short leaf-stalks which clasp the stem and then expand into stipule-like structures, $1\frac{1}{2}$ -3 in. long. Calyx densely covered with stalked glands, remaining in the fruit; teeth small, $\frac{1}{2}$ in. long. Corolla white; tube 1 in. long; lobes $\frac{1}{3}$ in. long. Filaments as long as the corolla-tube. Capsule oblong, pointed. Flowers in December and January.

In hedges and jungles. The plant possesses an underground stem which continues to live while the part above ground dies down each year. The root is used in medicine.

Plumbago capensis, Thunb.

A small erect shrubby herb. Leaves lanceolate, arranged in whorls of 5 each, $\frac{1}{2}$ -2 in. long. Flowers pale blue. Flowers in the rainy and cold weather. A native of the Cape of Good Hope. Frequently grown in gardens.

Myrsinaceae

Trees or shrubs. Leaves alternate. Calyx 4- to 6-lobed, persistent. Corolla-tube short, 4- to 6-lobed. Stamens as many as and opposite to the corolla-lobes. Ovary 1-celled. Ovules few or many. Fruit a 1- to many-seeded berry.

Aegiceras, Gaertn.

Sea-coast shrubs or trees. Branches glabrous. Leaves entire, glabrous, leathery. Flowers in umbels or panicles. Calyx-lobes 5, twisted and overlapping in the bud. Corolla tube short; lobes 5, overlapping in bud and afterwards bent backwards. Stamens 5. Filaments joined below. Ovary spindle-shaped. Ovules many. Fruit cylindrical, curved, leathery, splitting longitudinally. Seeds single, elongate.

Aegiceras corniculatum, Blanco. (*Aegiceras majus*, Gaertn.)

A small tree. Leaves obovate, glabrous, shiny, leathery, 2-3½ in. long. Flowers in umbels at the ends of branches or opposite the leaves, white. Fruit narrow, cylindrical, curved, brown, about 2½ in. long.

It occurs in mangrove swamps near the sea and in tidal creeks along the Coromandel Coast. It probably occurs at Ennur and other places near Madras but I have not collected it.

Sapotaceae

Trees or shrubs with milky juice. Leaves alternate, entire. Flowers in clusters in the axils of leaves. Calyx 4 to 8-lobed. Corolla-tube very short; lobes as many or 2-4 times as many as the calyx-lobes. Stamens inserted on the corolla-tube, as many as the corolla-lobes and opposite to them, or 2 or 3 times as many. Staminodes when present alternating with the petals. Ovary 2- to 8-celled. Ovules one in each cell. Fruit a 1- to 8-seeded berry. Seeds large, shiny.

Calyx-lobes 4; sterile stamens absent	...	...	...	...	Bassia.
Calyx-lobes 6 or 8; sterile stamens present	...	...	...	...	Mimusops.

Bassia, Linn.

Trees. Flowers crowded near the ends of the branches. Corolla-lobes 8-10. Stamens twice as many as the corolla-lobes. Ovary 6- to 8-celled. Fruit a 1- to 3-seeded berry.

Bassia longifolia, Linn. The Narrow-leaved Mohua

இலுப்பைமரம்

ఇష్టచెట్టు

A large tree. Leaves oblong-lanceolate, glabrous when mature, 3-5 in. long, 1-1¾ in. broad. Flowers appearing in dense clusters with the young leaves, carried on stalks 1½-2½ in. long. Calyx covered with soft brown hairs. Corolla fleshy, yellowish, with an unpleasant smell. Stamens 16-20. Fruit ovoid, 1-2 in. long. Seeds 1 or 2. Flowers in February and March.

A native of the West Coast. Grown in gardens and parks in Madras City. Guindy Park. The flowers on fermentation and distillation yield a kind of toddy as in the case of *Bassia latifolia*, the Common Mohua.

Mimusops, Linn.

Trees. Calyx-lobes 6 or 8. Corolla-lobes 18 or 24, in 2 rows, the inner row made up of 6 or 8 lobes. Stamens 6 or 8, attached to the corolla-tube opposite the inner corolla-lobes. Staminodes resembling petals, sometimes fringed at the apex. Ovary hairy, 6- to 8-celled. Fruit a berry with a tough outer skin.

Calyx-lobes and stamens 8 each; leaves shortly acuminate at apex Elengi.
 Calyx-lobes and stamens 6 each; leaves obtuse or slightly notched at apex hexandra.

Mimusops Elengi, Linn.

மகிழ்மரம்

Pi. XXIII, A.

పాండచెట్టు

An evergreen tree. Leaves elliptic, glabrous, shiny, $2\frac{1}{2}$ -4 in. long. Flowers standing singly or in clusters of 2-6, white, fragrant, $\frac{3}{4}$ -1 in. across. Calyx-lobes 8, the inner 4 narrower than the outer. Corolla-lobes 24, the inner series consisting of 8 and the outer of 16 lobes. Stamens 8. Staminodes 8, lanceolate, acuminate, densely clothed on the back and margins with white hairs. Berry ovoid, yellow when ripe, about 1 in. long. Flowers April to August.

A native of the hill-forests of the Presidency. Commonly planted in gardens in the City of Madras. The flowers are much esteemed and a perfume is distilled from them. The bark is used in Indian medicine.

Mimusops hexandra, Roxb.

A small tree. Leaves oblong, obtuse or slightly notched at apex, glabrous, shiny above, 3-4 in. long. Flowers standing singly or few together in the axils of leaves. Calyx-lobes 6, the 3 inner ones narrower than the 3 outer. Corolla-lobes 18, 6 of them forming the inner whorl. Stamens 6. Staminodes glabrous, toothed at apex. Ovary 12-celled. Berry ovoid, reddish-yellow when ripe, 1-seeded, $\frac{3}{4}$ in. long.

Vandalur, at the foot of the hills.

Achras Sapota, Linn. The Sapota or Sapodilla Plum

అపేరల్

సపొటా

A fruit tree introduced from America and occasionally cultivated in gardens. Fruit ripens in the hot weather.

Ebenaceae

Trees or shrubs. Leaves alternate, entire, leathery. Male and female flowers on separate plants. Corolla-lobes 3-7. Stamens in male flowers as many, twice or thrice as many as the corolla-lobes, or numerous. Ovary in female flowers 3- to 10-celled. Styles 2-8. Ovules as many or twice as many as the styles. Fruit a tough or fleshy berry, several- or few-seeded.

Sepals and petals 3 each; ovary 3- or 6-celled Maba.

Sepals and petals 4 or 5 each; ovary 4- or 5- or 8- to 10-celled... Diospyros.

Maba, Forst.

Trees or shrubs. Flowers in small dense cymes. Calyx enlarged in fruit, 3-lobed. Corolla-lobes 3, twisted in the bud. Stamens in male flowers 3-22. Ovary in female flowers 3-celled. Ovules 6. Style 3-branched. Fruit fleshy or dry with 1-6 cells and seeds.

Maba buxifolia, Pers.

Pl. XXIV, A. தமிழ்

A shrub. Leaves obovate, rounded or slightly notched at apex, leathery, under 1 in. long. Flowers 1-3 together in the axils of leaves, very small, white. Stamens 6. Fruit a globose berry, red, $\frac{1}{4}$ in. in diameter. Flowers March to June.

In scrub jungle. Pallavaram. Vandalur. Avadi.

Diospyros, Linn.

Trees. Leaves sometimes almost opposite. Sepals and petals 4 or 5 each. Stamens in male flowers 4 to many. Ovary in female flowers 4- or 5-celled or sometimes 8- to 10-celled. Ovules 1 or 2 in each cell. Styles or stigmas 1-4. Fruit with pulpy or sticky juice, supported by the enlarged calyx.

Leaves up to 8 in. long; branches not thorny tomentosa.

Leaves 1-2 in. long; branches often thorny chloroxylon.

Diospyros tomentosa, Roxb.

A small tree. Leaves opposite and also alternate, obtuse at apex, hairy when young, glabrous when mature. Flowers in male plants arranged in cymes. Stamens 16. Female flowers standing singly. Fruit $1\frac{1}{2}$ in. in diameter. Seed $\frac{1}{2}$ in. long. Fruit ripening in March.

Avadi and Vandalur.

Mr. Fischer in his Forest Flora of East Central Madras does not mention this species. Gamble in his Flora gives for its locality "Northern Circars down to the Godavari, in deciduous forests".

Diospyros chloroxylon, Roxb.

தமிழ்

A small tree or a large shrub. Branches thorny. Leaves elliptic, obovate or elliptic-oblong, minutely hairy above, covered with brownish hairs below, 1-2 in. long. Flowers in the axils of leaves. Male flowers, in few-flowered clusters, small. Female ones standing singly, small, white. Fruit globose, yellow, edible, $\frac{1}{3}$ in. in diameter. Flowers May to September.

Avadi.

Oleaceae

Climbing or erect shrubs or trees. Leaves opposite, pinnately compound or simple. Flowers arranged in cymes or panicles. Calyx- and corolla-lobes 4-9. Stamens 2. Ovary 2-celled. Ovules 2 in each cell. Fruit a capsule, berry or drupe.

Fruit a capsule ; small trees or large shrubs	...	...	...	Nyctanthes (cultivated).
Fruit a berry ; shrubs, usually climbing	...	...	...	Jasminum.

Nyctanthes, Linn.

Shrubs or small trees. Flowers in small bracteate heads, arranged in branching cymes at the ends of branches. Corolla salver-shaped; lobes 4-8, contorted in bud, spreading, white. Fruit a circular capsule.

Nyctanthes Arbor-tristis, Linn.

பாழமுல்விதை வாசிச்சு

A shrub or small tree, rough all over with stiff whitish hairs. Leaves ovate, acute, rough above, hairy beneath, entire, 2-3 in. long. Flowers delightfully fragrant. Corolla $\frac{1}{2}$ in. long; tube orange-coloured; lobes white. Capsule $\frac{3}{4}$ in. long, somewhat circular, compressed, separating into 2 flat 1-seeded parts. Flowers practically all the year round except at the end of the cold weather when the tree stands bare of leaves.

Wild in the deciduous forests of the Northern Circars. Very frequently grown in Indian gardens and temple compounds. The flowers open at night-fall and drop off early in the morning. They are collected from under the bushes and used for worship.

Jasminum, Linn.

Erect or climbing shrubs. Leaves simple or pinnately compound. Flowers handsome, sweet-scented as a rule, arranged in cymes. Calyx-lobes 4-9. Corolla-tube narrow; lobes 4-10, imbricate. Ovules 2 in each cell. Style slender. Stigma 2-cleft. Fruit a lobed or a simple berry with 1 seed for each carpel.

1 Leaves simple	...	...	...	...	...	...	2
Leaves compound, the 2 lower leaflets very small or sometimes wanting, in the latter case the petiole jointed	...	...	...	...	...	auriculatum.	
2 An erect or somewhat erect shrub; calyx-lobes softly hairy	...	...	...	...	...	Sambuc (cultivated).	
Climbing shrubs; calyx-lobes glabrous	...	...	...	...	...	3	
3 Calyx-lobes over $\frac{1}{4}$ in. long	...	...	...	...	...	sessiliflorum.	
Calyx-lobes less than $\frac{1}{5}$ in. long	...	...	...	...	...	angustifolium.	

Jasminum auriculatum, Vahl

A climbing shrub, young parts softly hairy. The 2 lateral leaflets very small and sometimes absent; the central leaflet broadly ovate, obtuse or acute, covered with velvety hairs, up to $1\frac{1}{4}$ in. long. Flowers white, in many-flowered corymbose cymes. Calyx-teeth minute. Corolla scented, $\frac{3}{4}$ in. long; lobes 5-7. Fruit single-seeded, black, $\frac{1}{5}$ in. in diameter. Flowers August to October.

Vandalur Hills. Also cultivated in gardens for the scented flowers.

Jasminum Sambuc, Ait. Arabian Jasmine

மல்விகை మల్లె

A small erect shrub. Leaves broadly ovate, $1\frac{1}{2}$ -4 in. long. Flowers white, fragrant, in 3-flowered cymes at the ends of branches. Corolla-tube $\frac{1}{2}$ in. long; lobes as long as the tube. Berry black, $\frac{1}{4}$ in. in diameter.

Commonly cultivated in gardens for its sweet-scented flowers.

Jasminum sessiliflorum Vahl

Pl. XX, B.

A climbing shrub. Leaves simple, ovate, acute, nearly glabrous, nerves obscure, up to $1\frac{1}{4}$ in. long, those at the ends of branches smaller. Flowers almost stalkless, single or in cymes of 2 or 3 flowers at the ends of slender branches. Calyx-teeth 7. Corolla-tube short; lobes 9, linear, about $\frac{1}{2}$ in. long. Fruit globose, black when ripe, single-seeded, about $\frac{1}{3}$ in. in diameter. Flowers in July and August.

Usually found climbing on *Opuntia*.

Jasminum angustifolium, Vahl

காட்டுமல்லிகை అడవిమల్లె

A wiry climbing shrub. Younger branches covered with minute soft hairs. Leaves ovate, acute, glabrous, nerves few and obscure, $1\frac{1}{2}$ -2 in. long, those on younger branches much smaller. Leaf-stalks about $\frac{1}{8}$ in. long. Flowers usually single or in cymes of 2 or 3. Flower-stalks slender, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Calyx 7- to 9-toothed; teeth $\frac{1}{8}$ in. long. Corolla fragrant, white, sometimes purplish on the outside in the bud; tube $\frac{1}{2}$ - $\frac{3}{4}$ in. long; lobes 8-10, lanceolate, $\frac{1}{2}$ - $\frac{5}{8}$ in. long. Fruit ellipsoid, unsymmetrical, $\frac{1}{3}$ in. long. Flowers August to November.

In open places. Chetpat. Adyar. Vandalur.

Salvadoraceae

Trees or shrubs. Leaves opposite. Flowers not conspicuous, arranged in racemes, panicles or spikes. Calyx 4-toothed. Corolla 4-lobed or made up of 4 green petals, imbricate. Stamens 4. Ovary 1-celled with a single ovule, or 2-celled with 2 ovules in each cell. Fruit a berry or a drupe.

Plants not armed with spines; petals united together; ovary

1-celled *Salvadora*.

Plants armed with spines; petals free; ovary 2-celled *Azima*.

Salvadora, Linn.

Trees or shrubs. Tube of corolla short. Fruit a drupe supported by the persisting calyx and corolla.

Salvadora persica, Linn.

Pl. XXII, A.

A small evergreen tree with drooping branches. Leaves elliptic-lanceolate or ovate, obtuse, glabrous, 1-2 in. long. Flowers small, greenish-yellow, in panicles at the ends of branches or in the axils of leaves. Corolla-lobes reflexed. Drupe globose, red when ripe, $\frac{1}{8}$ in. in diameter. Flowers February to March.

Ennur, near the backwater.

Azima, Lamk.

Shrubs armed with spines in the axils of leaves. Flowers small, arranged in small slightly-branched panicles. Male and female flowers on separate plants. Calyx with 4 teeth. Petals 4. Ovules 1 or 2 in each cell. Berry globose.

Azima tetracantha, Lam.

சங்கஞ்செடி கெட்டி.

A low bush. Branches rigid, bluntly 4-sided. Leaves elliptic, acute, with a sharp point at apex, glabrous, shiny, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Spines obtusely 4-sided, grooved, very sharp, with an indurated point, usually 4 or fewer at each node, about 1 in. long. Flowers small, greenish-white, not stalked, arranged in clusters in the axils of leaves. Very often the leaves about the extremities of branches much reduced or absent so that the flowering branches end in interrupted spikes. Bracts spine-pointed. Male flowers crowded in panicles in the axils of leaves. Female flowers standing singly or in pairs. Ovules 1 in each cell. Berry usually 1-seeded, white, edible, $\frac{1}{2}$ in. in diameter. Flowers February to April.

In open places. Guindy Road, Adyar.

Apocynaceae

Plants almost all with milky juice. Leaves opposite, whorled or sometimes alternate. Flowers often large and showy with the parts in fives. Corolla salver-shaped or funnel-shaped; the lobes overlapping each other in bud. Filaments usually short; anthers free or joined together into a cone and adherent to the stigma by the connective, sometimes produced backwards into empty spurs at the base. Ovary 2-celled (1-celled in *Allamanda*) or of 2 distinct carpels. Ovules 2, few or many. Fruit a fleshy drupe or berry or consisting of 2 follicles.

- | | | |
|----|---|--------------------------------|
| 1 | Anthers free from the stigma, cells not produced at their bases into spurs | 2 |
| | Anthers united to the stigma, cells produced at their bases into spurs | 9 |
| 2 | Ovary 1- or 2-celled | 3 |
| | Ovary consisting of 2 separate carpels. (In <i>Rauwolfia</i> the carpels are united in the ripe fruit) | 4 |
| 3 | Ovary 1-celled; spineless shrubs | <i>Allamanda</i> (cultivated). |
| | Ovary 2-celled; shrubs armed with spines | <i>Carissa</i> . |
| 4 | Leaves alternate | 5 |
| | Leaves opposite or whorled | 7 |
| 5 | Fruit not breaking open; corolla funnel-shaped | 6 |
| | Fruit consisting of 2 follicles; corolla salver-shaped | <i>Plumiera</i> . |
| 6 | Flowers yellow; leaves linear | <i>Thevetia</i> . |
| | Flowers white; leaves oblanceolate-oblong, fleshy | <i>Cerbera</i> . |
| 7 | Leaves whorled; fruit a drupe | <i>Rauwolfia</i> . |
| | Leaves opposite; fruit follicular | 8 |
| 8 | Herbs or small shrubs; calyx without glands on the inside | <i>Lochnera</i> . |
| | Shrubs; calyx having glands on the inside | <i>Ervatamia</i> (cultivated). |
| 9 | Anthers extending beyond the corolla-tube | 10 |
| | Anthers placed inside the corolla-tube | 11 |
| 10 | Climbing shrubs; corolla-throat without a corona; seeds with a tuft of hairs at the apex | <i>Vallaris</i> . |
| | Erect trees; a corona of scales present at the throat of the corolla; seeds with a tuft of hairs at the base | <i>Wrightia</i> . |
| 11 | Leaves opposite; climbing shrubs; flowers rather small | <i>Ichnocarpus</i> . |
| | Leaves in whorls of three; large erect shrubs; flowers large | <i>Nerium</i> (cultivated). |

Allamanda

An American genus introduced into gardens.

Allamanda cathartica, Linn.

A sprawling shrub with white latex. Leaves 4 in each whorl, ovate-lanceolate, acuminate. Flowers large, yellow, about 3 in. long.

A native of Guiana. Frequently grown in gardens.

Carissa, Linn.

Thorny shrubs. Leaves opposite, leathery. Flowers in branched cymes. Corolla with a very narrow tube and spreading limbs. Stamens at the top of the corolla-tube. Berry 2-celled or by abortion 1-celled. Seeds 2 or 4.

Carissa spinarum, Linn.

களாச்செடி Pl. XVIII, A. ௧௦௩

A semi-erect or prostrate shrub with zigzag branches. Spines $\frac{1}{2}$ - $1\frac{1}{4}$ in. long. Leaves ovate or circular, up to $1\frac{1}{2}$ in. long. Flowers in cymes at the ends of branches. Corolla-tube about $\frac{1}{4}$ in. long or slightly more; lobes spreading, scented, white. Stamens inside the corolla-tube. Berry dark purple, 4-seeded, $\frac{1}{4}$ in. in diameter. Flowers March to September.

Very common in jungle at Pallavaram, Avadi, Guindy Park, Vandalur, Chetpat and Adyar. The fruit is edible raw and pickled.

Var. microphylla, Gamble

A smaller plant with smaller leaves ($\frac{1}{2}$ - $\frac{3}{4}$ in. long) and smaller flowers. In scrub jungle at Avadi.

Carissa carandas, Linn.

ஆனைக்களாச்செடி வாக்கெட்டி

A large shrub or small tree. A native of dry forests. Occasionally cultivated in gardens. The red berries turn purple when ripe and are edible.

Plumiera, Linn.

Erect trees. Branches stout. Leaves scattered, nerves numerous and horizontal. Flowers large, in branching cymes at the ends of branches. Calyx small, glandular within. Corolla salver-shaped, throat naked. Stamens near the base of the corolla-tube. Follicles 2. Seeds many.

Plumiera acutifolia, Poir. The Pagoda Tree

ஆம்றலரி

వాడకన్నేరు

A small tree with fleshy branches. Leaves disposed at the ends of branches, elliptic-lanceolate, pointed, glabrous, leathery, 8-10 in. long. Flowers large, white with yellow centre, scented. Flowers April to September. A native of South America.

Frequently grown in gardens and occasionally found run wild. The tree rarely sets seed in Madras and is propagated by cuttings. It stands bare of leaves in the hot months.

Plumiera alba, Linn. Frangipani

சேமை அலரி

తెల్లకన్నేరు

A small tree. Leaves oblong, shiny, apex obtuse, not falling. Flowers pure white. A native of the West Indies occasionally found in gardens.

Thevetia, Juss.

Shrubs or trees. Leaves alternate, linear. Flowers in cymes at the ends of branches. Calyx with glands inside. Corolla large and showy, funnel-shaped, yellow. Anthers inside the throat of the corolla.

Thevetia nerifolia, Juss.

மஞ்சள் அலரி

Pl. XVIII, B.

పచ్చకన్నేరు

A bush or small tree. Leaves closely arranged, shiny, midrib prominent, about 5 in. long, $\frac{1}{3}$ in. broad. Flowers yellow, fragrant, 2 in. long, about 1 in. broad at the mouth. Fruit angular, apple-like in appearance, poisonous. Flowers all through the year.

A native of South America. It grows quickly and is much used as a fencing plant. It has run wild throughout the area.

Cerbera, Linn.

Small trees. Leaves alternate, nerves horizontal and parallel. Flowers large, at the ends of branches. Scales on the corolla 5. Stamens small, inside the corolla-tube. Ovules 8. Fruit a drupe with very thick, fibrous coating.

Cerbera manghas, Linn. (*Cerbera Odollam*, Gaertn.)

சடலலரி

Pl. XVIII, C.

A moderate-sized tree. Juice milky. Leaves lanceolate or oblanceolate, apex abruptly tapering, leathery, shiny, 5-10 in. long. Flowers large, white with yellow throat, scented. Fruit sub-globose, green, 2-4 in. long. Seeds single. Flowers during the rains and after.

A maritime species. In salt swamps and along backwaters. Along the canal in the People's Park. The fruit is often found washed ashore on the beach.

Rauwolfia, Linn.

Shrubs with 3 or 4 leaves at each node. Flowers in umbel-like cymes. Corolla-tube cylindrical, dilated above the anthers, mouth constricted, usually hairy inside. Stamens inside the corolla-tube. Ovules 2 in each carpel. Fruit of 2 united or distinct drupes each with a single seed (pyrene).

Rauwolfia canescens, Linn.

பாம்புக்களாச்செடி. Pl. XVIII, D.

A small shrub about 4 ft. high. Leaves 4 at each node, unequal in size, elliptic-oblong, acute, up to 3 in. long. Flowers small, white. Drupes bright red, ovoid or spherical, about $\frac{1}{4}$ in. in diameter. Flowers almost all through the year.

A native of the West Indies. It was introduced as a garden plant but it has escaped and become one of the commonest weeds in Madras and is spreading into the surrounding country. It has advanced as far as Ennur on the north and Guindy on the south.

Lochnera, Reichb. (Vinca, Linn.)

Herbs or small shrubs having numerous glands in the axils of leaves. Flowers standing singly or in pairs. Corolla salver-shaped; tube slender, inflated above the stamens and below the constricted mouth. A pair of glands present between the 2 carpels, one on each side. Fruit of 2 slender follicles with numerous seeds.

An erect annual herb; leaves lanceolate; flowers small ... pusilla.

A small shrub; leaves obovate; flowers moderately large ... rosea.

Lochnera pusilla, K. Schum. (Vinca pusilla, Murr.)

A much-branched annual herb with 4-angled stems. Leaves oblanceolate, acute, glabrous, thin, margins rough, $1\frac{1}{2}$ -3 in. long. Flowers white, on short stalks. Mouth of corolla hairy. Fruit of 2 slender divergent follicles 2 in. long. Seeds oblong. Flowers November to March.

A weed of cultivated ground.

Lochnera rosea, Reichb. (Vinca rosea, Linn.) Madagascar Periwinkle

Pl. XVIII, E. விஷ்ணு

A small shrub about 3 ft. high. Leaves thick, obovate, entire, shiny, about $2\frac{1}{2}$ in. long. Flowers white or pink, 2 in. in diameter. Follicles about 1 in. long. Flowers all the year round.

A native of the West Indies frequently grown in gardens. It has run wild in many places and on the sandy tracts between Tiruvottiyur and Ennur it covers an extensive area.

Ervatamia Stapf. (*Tabernaemontana*, Linn.)

Shrubs. Leaves opposite. Axillary stipules usually distinct. Flowers in corymbiform or umbelliform cymes, often in pairs. Calyx glandular inside. Corolla salver-shaped; tube cylindrical, slightly dilated towards the naked mouth, finely hairy below the dilation; lobes 5, much folded in bud. Stamens within the corolla-tube. Ovary of 2 carpels, distinct or slightly cohering. Fruit of 2 follicles.

Ervatamia coronaria, Stapf. (*Tabernaemontana coronaria*, R. Br.)

நந்தியரவட்டம் சாம்பரத்தி

A shrub 3-8 ft. high. Leaves oblanceolate or obovate, acuminate, shiny, 3-6 in. long. Flowers pure white. Corolla fragrant at night, up to 1 in. long; tube dilated below the middle. Flowers profusely during the rains and after.

A very common garden shrub. The flowers are used by Hindus in worship. It is believed to be indigenous to Northern India, probably the Sub-Himalayan regions. A variety with double flowers is also met with.

Vallaris, Burm.

Twining shrubs. Leaves opposite, minutely spotted. Flowers white, in branching cymes. Calyx-lobes narrow. Corolla salver- or wheel-shaped; throat naked; lobes broad, spreading, overlapping to the right. Stamens inserted at the top of the corolla-tube. Anthers united to form a cone round the stigma and adherent to it; the connective often with a large dorsal gland; cells with rigid basal spurs. Disk 5-lobed. Ovary of 2 carpels, united at first. Ovules many. Style slender. Stigma thick, often 2-lobed at tip. Fruit of 2 follicles, at first joined, afterwards separating. Seeds in two series, rounded below, attenuated above into a beak furnished with long white hairs.

Vallaris solanacea, O. Kze. (*Vallaris Heynei*, Spreng.)

A climbing shrub. Leaves elliptic-lanceolate, acute, glabrous, 2-4 in. long. Flowers 3-10 in each cyme, white, fragrant. Corolla finely hairy outside; limb spreading, divided into 5 obtuse lobes, $\frac{3}{4}$ in. across. Ovary hairy. Fruit straight, pointed, 4-6 in. long, $1\frac{1}{2}$ -2 in. broad. Seeds ovoid, beaked, with a coma of silvery white hairs, $\frac{1}{2}$ in. long. Flowers in February and March.

Occasionally found in hedges. Chetpat.

Wrightia, R. Br.

Trees with slender branches. Corolla salver-shaped, with a corona of scales at the throat. Anther-cells spurred at the base, adherent to the stigma. Fruit of 2 follicles. Seeds tapering at the apex and having at the base a coma the hairs in which fall off.

Wrightia tinctoria, R. Br.

வெட்டாரை Pl. XVIII, F. ரெட்டை

A moderate-sized tree. Leaves on rather short stalks, elliptic-lanceolate, acuminate, glabrous, 3-6 in. long. Flowers arranged in clusters at the ends of branches, scented. Calyx having glands on the inside. Corona of numerous linear scales. Fruit of 2 slender cylindrical hanging follicles, tapering at both ends, united at the tip, 10-20 in. long. Seeds $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Flowers April to May, often continuing till July.

A common tree, both wild and cultivated. The tree stands bare of leaves in February and March. The leaves furnish a blue dye. The wood is white and easily turned.

Ichnocarpus, R. Br.

Climbing shrubs with slender branches. Flowers fairly small, in the axils of leaves or at the ends of branches. Corolla salver-shaped; lobes deflexed in the bud and in the flower. Anthers cohering to the stigma; cells spurred at the base. Style short. Fruit of 2 follicles. Seeds numerous, crowned with a silky coma which soon falls off.

Ichnocarpus frutescens, R. Br.

செதிலி

A much-branched extensively-climbing shrub. Young parts covered with fine rust-coloured hairs. Leaves elliptic-oblong, acute, up to 3 in. long. Flowers greenish-white. Follicles very slender, 4-6 in. long. Seeds $\frac{2}{3}$ - $\frac{3}{4}$ in. long, with a white coma nearly as long. Flowers October to December.

Guindy Park. Avadi. Vandalur.

Nerium, Linn.

Erect glabrous shrubs. Leaves 3 or 4 at a node, narrow, leathery. Flowers large, in raceme-like cymes. Corolla broadly funnel-shaped; tube cylindrical; throat with 5 broad-toothed scales. Stamens inside the corolla-tube. Anthers joined together and adhering to the stigma; cells with long spurs at their bases. Fruit of 2 follicles, cylindrical, straight, hard. Seeds oblong, with comas at the apices.

Nerium odorum, Soland. The Oleander

அலரி கன்னேயு, கன்னா பட்டை

A large shrub. Leaves linear-lanceolate, rigid, leathery, 4-6 in. long; mid-rib stout; nerves numerous, slender, at right angles to mid-rib. Flowers in cymes at the ends of branches. Corolla sweet-scented, red, pink or white, $1\frac{2}{3}$ in. across. Flowers almost all the year round.

A native of Northern India. Very familiar in gardens and occasionally found run wild.

Asclepiadaceae

Herbs or shrubs, usually twining. Leaves opposite, sometimes whorled or altogether absent. Flowers in umbel-like cymes. Calyx usually deeply 5-lobed. Corolla 5-lobed, often furnished within with processes forming a corolline corona. Stamens 5, usually dilated; the filaments united into a staminal column, the apex of the latter united to the top of the style and usually having fleshy processes on the back forming a staminal corona. Anthers 2-celled. Pollen contents of anther-cells granular or united into pollen-masses. Ovary of 2 one-celled, many-ovuled units. Fruit of 2 (or 1) follicles. Seeds usually flat, with a tuft of long silky hairs.

- | | | | | | | | | | |
|----|---|-----|-----|-----|-----|-----|-----|----|----------------------|
| 1 | Leafless plants | ... | ... | ... | ... | ... | ... | 2 | |
| | Leafy plants (leaves absent in <i>Ceropegia juncea</i> which may be identified by its funnel-shaped corolla about $1\frac{7}{8}$ in. long and inflated below) | ... | ... | ... | ... | ... | ... | 3 | |
| 2 | Straggling plants with cylindrical stems | ... | .. | ... | ... | ... | ... | | <i>Sarcostemma.</i> |
| | Erect succulent plants with square stems | ... | ... | ... | ... | ... | ... | | <i>Caralluma.</i> |
| 3 | Filaments free | ... | ... | ... | ... | ... | ... | 4 | |
| | Filaments united into a column | ... | ... | ... | ... | ... | ... | 5 | |
| 4 | Corolla-lobes valvate | ... | ... | ... | ... | ... | ... | | <i>Hemidesmus.</i> |
| | Corolla-lobes overlapping each other in the bud | ... | ... | ... | ... | ... | ... | | <i>Cryptostegia.</i> |
| 5 | Stems erect | ... | ... | ... | ... | ... | ... | | <i>Calotropis.</i> |
| | Stems twining | ... | ... | ... | ... | ... | ... | 6 | |
| 6 | Corolla-tube very long | ... | ... | ... | ... | ... | ... | | <i>Ceropegia.</i> |
| | Corolla-tube very short | ... | ... | ... | ... | ... | ... | 7 | |
| 7 | Follicles covered with soft spines | ... | ... | ... | ... | ... | ... | | <i>Pergularia.</i> |
| | Follicles not covered with spines | ... | ... | ... | ... | ... | ... | 8 | |
| 8 | Corolla-lobes valvate; both corolline and staminal corona present | ... | ... | ... | ... | ... | ... | | <i>Leptadenia.</i> |
| | Corolla-lobes overlapping to a greater or less extent; corona either corolline or staminal | ... | ... | ... | ... | ... | ... | 9 | |
| 9 | Corolla-lobes overlapping slightly; corona corolline | ... | ... | ... | ... | ... | ... | | <i>Gymnema.</i> |
| | Corolla-lobes overlapping considerably; corona staminal | ... | ... | ... | ... | ... | ... | 10 | |
| 10 | Corolla divided nearly to the base; leaves small | ... | ... | ... | ... | ... | ... | | <i>Pentatropis.</i> |
| | Corolla divided less nearly to the base; leaves fairly large | ... | ... | ... | ... | ... | ... | 11 | |
| 11 | Style short; corolla-lobes broadly oblong or ovate | ... | ... | ... | ... | ... | ... | | <i>Marsdenia.</i> |
| | Style moderately long; corolla-lobes linear-oblong | ... | ... | ... | ... | ... | ... | | <i>Toxocarpus.</i> |

Sarcostemma, R. Br.

Shrubs with trailing, leafless, jointed, branching stems. Flowers fairly small, in umbels. Calyx small. Corolla flat and circular in outline; lobes 5, overlapping in bud. Corona of two series; the outer cup-shaped, thin and attached to the base of the staminal column; the inner of 5 erect fleshy processes adherent to the stamens above. Filaments forming a column. Anthers with membranous appendages. Pollen masses curved, slender, hanging, attached by short stalks to the hard pollen-carriers. Fruit consisting of 2 straight smooth follicles.

Sarcostemma brevistigma, Wt. & Arn.

Pl. XIX, B. சீரெய்யா

Stems, green, glabrous, up to $\frac{3}{8}$ in. in diameter. Flowers in unstalked, many-flowered umbels at the ends of branches. Corolla white. Outer corona 10-lobed; inner corona thick, fleshy, longer than the staminal column and almost concealing the anthers. Follicles tapering at both ends, straight, 4-5 in. long. Flowers July to December.

Trailing over bushes. In scrub jungle at Avadi, Guindy Park and Vandalur.

Caralluma, R. Br.

களிமுளியான்

Perennial fleshy square-stemmed plants. Leaves minute, on the angles of the stem, soon falling. Flowers in umbels at the ends of branches, or racemose on elongate branches. Calyx with 5 narrow lobes. Corolla flat or bell-shaped, with 5 lobes, valvate in bud. Corona double, the outer ring-like or cup-like with 5 bicuspidate lobes, the inner elongate and inflexed over the anthers. Staminal column short. Apex of style truncate, 5-angled. Fruit of 2 linear-lanceolate follicles. Seeds oblong, flattened, ending in a silky coma.

- | | | | | | | | | |
|---|--|-----|-----|-----|-----|-----|-----|---------------|
| 1 | Flowers in umbels | ... | ... | ... | ... | ... | ... | indica. |
| | Flowers arranged racemosely, 1 or 2 together on the sides | | | | | | | |
| | of elongate branches | ... | ... | ... | ... | ... | ... | 2 |
| 2 | Corolla-lobes fringed with elongate hairs; flowers | | | | | | | |
| | pendent | ... | ... | ... | ... | ... | ... | attenuata. |
| | Corolla-lobes not fringed but bearing spindle-shaped hairs | | | | | | | |
| | at the tips only; flowers erect | ... | ... | ... | ... | ... | ... | stalagmifera. |

Caralluma indica, N.E. Br. (Hutchinia indica, Wt. & Arn. Boucerosia Hutchinia, Decne.)

பூக்கிணி

A small herb not more than 8 in. high. Stems numerous, about $\frac{1}{4}$ in. across. Underground stems numerous, horizontal, white, spreading beneath and coming up in various places. Umbels having not more than 12 flowers each. Corolla cup-shaped,

greenish inside and outside, having elongate purple hairs all over the inside except the part near the apex of the corolla-lobes, having a faint smell suggestive of decaying fungi not characteristic of any other member of the genus, $\frac{3}{4}$ in. across. Flowers November to January.

Avadi. Vandalur. Guindy. The stems are used as a vegetable.

There are good reasons for keeping this species and the allied ones that have spreading underground stems separate from the rest of the "Carallumas," in which case the original name *Hutchinia indica* might be restored.

Caralluma attenuata, Wt.

Pl. XIX, C. కంఠేటికొమ్మలు

Stems becoming very slender and cylindrical at the upper ends. Corolla-tube short, funnel-shaped; lobes densely fringed with long hairs, greenish dotted with purple on the outside, dark purple and banded with fine green lines on the inside of the tube. Follicles 2, linear-lanceolate, 4-6 in. long. Flowers in the rainy weather and after.

Vandalur and Guindy. The stems are used as a vegetable.

Caralluma stalagmifera, Fisch.

Stems up to 3 ft. in height. Flowers few, standing singly on erect pedicels $\frac{1}{2}$ in. long, facing upwards. Corolla bell-shaped, $\frac{1}{2}$ in. across at the mouth. Corolla-tube short; lobes ovate-lanceolate, furnished with a minute white point at apex; a few spindle-shaped purple hairs dangling from the apex of the corolla-lobes below the minute, white point. Fruit of two follicles or sometimes a single follicle, with purplish longitudinal lines, $4\frac{3}{4}$ in. long. Flowers at various parts of the year particularly in the rainy months and after.

I first collected this plant at Vandalur in 1925. It was determined as a new species by Kew. Guindy, on the sides of the road to Adyar (1926). The corolla in Vandalur specimens is light purple inside and that in the Guindy specimens is dark purple inside.

Hemidesmus, R. Br.

Twining shrubby herbs. Leaves opposite or in whorls of 4. Flowers small, greenish-purple, crowded in the axils of leaves. Corolla flat, with 5 valvate fleshy lobes. Corona-scales 5, thick, on the corolla-tube and alternate with the lobes. Filaments distinct. Anthers small, cohering at the apex, ending in inflexed appendages. Fruit of 2 slender follicles.

Hemidesmus indicus, R. Br.

ஹெமிடீஸ்மிஸ் இண்டிகஸ்

A twining or prostrate, wiry shrub. Leaves varying from elliptic-oblong or almost circular to linear and narrow. Flowers small, greenish outside, purple inside. Follicles tapering to a point at the apex, 4-6 in. long. Flowers in December.

Guindy Park. Vandalur. Avadi. In hedges in the vicinity of Madras. The roots are employed as a substitute for sarsaparilla.

Cryptostegia, R. Br.

Lofty climbers. Flowers large, in cymes at the ends of branches. Corolla funnel-shaped; tube short; throat bell-shaped; lobes broad, overlapping and twisted in bud. Corona at the base of the throat of the corolla. Filaments short, free. Anthers adherent to the stigma. Fruit of 2 thick, hard, 2-winged follicles furrowed between the wings.

Cryptostegia grandiflora, R. Br.

Pl. XIX, A.

A tall climber. Leaves elliptic, tough, shiny, 3-4 in. long. Flowers large, rose-coloured, showy, about 3 in. long. Follicles woody, 4-5 in. long. Flowers October to January.

This is a native of Tropical Africa introduced as a garden plant. It has escaped and become thoroughly naturalized here. Common in hedges in the city and suburbs. The latex from the stem yields a kind of rubber.

Calotropis, R. Br.

Large erect shrubs. Leaves broad. Flowers medium-sized. Corolla broadly bell-shaped, divided more than half way down into 5 valvate lobes. Corona scales 5, fleshy, adherent to and radiating from the large staminal column. Fruit of 2 large, thick, inflated, fleshy follicles.

Calotropis gigantea, R. Br.

காலட்ரோபிஸ் ஜிஜன்டீயா Pl. XIX, D. கிஜன்டீயா

A large shrub. The branches and inflorescence covered with loose, soft, white, wooly hairs. Leaves without stalks, thick, obovate-oblong, covered with soft white hairs below, 4-8 in. long. Flowers in umbel-like cymes, purplish or white, 1½-2 in. in diameter. Petals somewhat fleshy and curled. Follicles thick, fleshy, 3½-4 in. long and 2 in. in diameter at base. Flowers almost all through the year.

Very common in open waste places.

The stems yield a valuable fibre. The milky sap yields a kind of rubber. The roots are used medicinally. The plant is considered sacred to Shiva by the Hindus.

Ceropegia, Linn. Lantern Flowers

Erect or twining herbs with tuberous roots. Calyx with 5 glandular scales within. Corolla tubular, the tube more or less inflated at the base, then elongate, 5-lobed. Corona arising from the short staminal column. Fruit of 2 follicles.

- | | | |
|---|--|-----------|
| 1 | Leaves absent (in Madras specimens) | juncea. |
| | Leaves present | 2 |
| 2 | Leaves fleshy; corolla less than $\frac{3}{4}$ in. long | bulbosa. |
| | Leaves thin; corolla $1\frac{1}{4}$ in. long | tuberosa. |

Ceropegia juncea, Roxb.

A fleshy twiner. Leaves small when present. Flowers in few-flowered cymes. Calyx divided to the base. Corolla greenish with yellow and purple markings, $1\frac{1}{2}$ in. long; tube inflated at the base, funnel-shaped above the middle; lobes nearly as long as the tube, becoming narrow, slightly bulged at apex, the tips united. Outer corona with 5 deeply 2-branched lobes. Inner corona-lobes linear, with hooked tips. Follicles 6-7 in. long. Flowers in August and September.

Near Guindy. Chetpat.

Ceropegia bulbosa, Roxb.

A twiner. Leaves elliptic-oblong or circular, pointed at apex, up to $1\frac{1}{2}$ in. long and as broad. Flowers in umbel-like cymes. Calyx divided to the base. Corolla greenish; tube inflated at the base; lobes linear from a triangular base, united at the tip, purple inside, $\frac{3}{4}$ in. long. Follicles about 4 in. long.

Near Guindy.

The leaves and the tubers are edible.

Ceropegia tuberosa, Roxb.

A glabrous slender twiner. Leaves variable, the lower ones somewhat circular in outline, the middle ones ovate, the upper ones oblong, ending in a sharp-pointed tip, glabrous, thin, $1\frac{1}{2}$ -4 in. long. Flowers grouped in the axils of leaves. Corolla pale green, yellowish inside, purple at the united tips of the lobes, $1-1\frac{1}{2}$ in. long; tube inflated at the base and enlarged at the mouth; limbs with broad bases and linear lobes. The outer corona with 5 small pockets alternating with the inner linear corona-lobes. Follicles $3\frac{1}{2}$ -5 in. long. Flowers in October and November.

Vandalur Hills.

Pergularia, Linn. (*Daemia*, Br.)

Shrubby twiners. Flowers medium-sized, in corymb-like or raceme-like cymes in the axils of leaves. Corolla-tube short; lobes 5, overlapping in bud. Corona in two series; the outer one thin and spreading; the inner of 5 erect lobes. Anthers attached directly to the pollen-carriers without the slender stalks usually present in this family. Fruit of 2 lanceolate follicles covered with soft spines.

Pergularia extensa, N.E. Br. (*Daemia extensa*, R. Br.)

வேலிப்பருத்தி జుట్టుగ, దుస్తుపు చెట్టు

A slender, bad-smelling, milky climber covered with stiff hairs. Leaves broadly ovate, thin, acuminate, covered with velvety hairs beneath, 2-4 in. long. Flowers greenish. Follicles curved backwards, upper ends produced into long beaks, covered with soft spines, 2-3 in. long. Flowers October to January.

Common in hedges. The plant is used in medicine.

Leptadenia, R. Br.

Climbing shrubs. Flowers small, in umbel-like cymes in the axils of leaves. Corolla deeply 5-lobed, flat, circular. Corona in 2 series; the outer of 5 fleshy pieces adherent to the corolla between the lobes; the inner minute, adherent to the base of the staminal column. Fruit of one thick, smooth follicle.

Lepatdenia reticulata, Wt. & Arn.

Pl. XIX, E.

A twining shrub. Leaves ovate, in young plants oblong-ovate, acute at apex, glabrous above, $1\frac{1}{2}$ -3 in. long. Flowers greenish-yellow, in roundish cymes. Follicles somewhat woody, tapering to a shortly-curved beak, $2\frac{1}{2}$ - $3\frac{1}{2}$ in. long. Flowers in July and August.

Very common in waste places.

Gymnema, R. Br.

Twining shrubs. Flowers small, in umbel-like cymes. Corolla-lobes slightly overlapping in bud. Corona of fleshy processes adherent to the corolla-tube. Anthers with small membranous appendages. Fruit of 1 or 2 smooth follicles.

Gymnema sylvestre, R. Br.

சிறுகுறிஞ்சா

A large woody climber. Leaves ovate, elliptic or ovate-lanceolate, softly hairy, $1\frac{1}{4}$ -2 in. long. Corolla yellow, small. Corona-lobes alternating with the corolla-lobes. Follicles lanceolate, narrowing into beaks, $2\frac{1}{2}$ -3 in. long. Flowers in November and December.

Vandalur Hills, climbing on trees.

Pentatropis, R. B.

Slender twining herbs. Flowers small, in umbel-like cymes. Corolla divided nearly to the base, overlapping in bud. Corona adherent to the backs of the anthers. Follicles small, lanceolate, narrowed to a beak.

Pentatropis microphylla, Wt. & Arn.

A slender glabrous twiner. Leaves broadly oblong or ovate-elliptic, obtuse, with a sharp point at apex. Flowers small, purplish, in few-flowered cymes. Follicles about $2\frac{1}{2}$ in. long. Flowers September to December.

Very common in hedges.

Marsdenia, R. Br. (*Dregia*, Meyer)

Twining shrubs. Flowers medium-sized, in umbel-like cymes. Corolla-lobes overlapping. Corona of five erect fleshy lobes adherent to the staminal column. Follicles thick.

Marsdenia volubilis, T. Cooke (*Dregia volubilis*, Benth.)

குடசப்பாலை

கூடிசாலை

A large climbing shrub. Leaves broadly ovate, mostly acuminate, $2\frac{1}{2}$ -6 in. long. Flowers numerous, yellowish-green, arising from a stalk between the petioles. Follicles woody, blunt at apex, 4 in. long, 1 in. broad. Flowers in November and December.

In jungly places near the city. Guindy. Adyar.

Toxocarpus, Wt. & Arn.

Twining shrubs. Flowers small or moderate-sized, in dichotomous raceme-like cymes. Calyx very small. Corolla-tube short, usually bell-shaped. Pollen-masses very minute, hanging. Seeds oblong, flattened, tipped with a silky coma.

Toxocarpus Kleinii, Wt. & Arn.

A slender climbing shrub, the young parts covered with reddish-brown hairs. Leaves ovate-oblong, shortly acuminate, glabrous on the upper surface, covered with reddish-brown hairs on the nerves of the under surface, up to 3 in. long. Flowers in branched cymes in the axils of leaves. Calyx covered with reddish-brown hairs, margins scaly. Corolla-lobes strap-shaped, recurved. Apex of style long, slender. Follicles tapering to a point at the apex, slightly curved, glabrous, 3-6 in. long. Seeds ovate-lanceolate.

On the borders of Mambalam Tank. A rare plant in our area. The locality recorded for this species by Gamble is "N. Circars, on the Godavari; Carnatic, hills of Trichinopoly; W. Ghats, Nilgiris, hills of Cochin."

Loganiaceae

Trees, shrubs or herbs. Leaves opposite. Stipules present or represented by transverse lines. Flowers in cymes in the axils of leaves or at the ends of branches. Calyx-lobes 4 or 5. Corolla 4- or 5-lobed; lobes imbricate or valvate. Stamens 4 or 5, inserted on the corolla-tube. Ovary 2-celled. Ovules 1 to many in each cell. Fruit a capsule or a woody berry.

Strychnos, Linn.

Trees (or climbing shrubs having tendrils). Leaves leathery, with 3-5 nerves starting from the base. Flowers white or yellowish. Corolla salver-shaped, valvate. Stamens 5 or 4. Ovary 2-celled or partially divided into two cells. Ovules many in each cell. Fruit a round woody berry. Seeds many, or 1 or 2, embedded in a fleshy pulp.

Corolla-tube much longer than the lobes; fruit 2 in.

in diameter Nux-vomica.

Corolla-tube as long as the lobes; fruit $\frac{1}{3}$ in. in diameter ... potatorum.

Strychnos Nux-vomica, Linn. The Strychnine Tree

எட்டிமரம் ముష్టిచెట్టు

A moderate-sized tree. Leaves broadly ovate or elliptic, obtuse or acute, leathery, glabrous, 5-ribbed at the base, $2\frac{1}{2}$ -5 in. long. Cymes many-flowered, at the ends of branches. Flowers greenish-white, with an unpleasant acrid smell. Corolla 5-lobed, less than $\frac{1}{2}$ in. long. Fruit globose, slightly rough but shiny, orange-red when ripe, fragrant, 1-3 in. in diameter. Seeds many, disc-shaped, concave on one side and convex on the other, covered with silky hairs, $\frac{3}{4}$ in. in diameter. Flowers in March.

Occasionally met with in our area in jungles. The seeds contain strychnine and are collected and exported to Europe.

Strychnos potatorum, Linn. The Clearing Nut Tree

தேற்றுகொட்டை விலங்கு

A small tree. Leaves ovate or elliptic, acute, glabrous, shiny, 3- or 5-nerved, somewhat leathery, 2-3 in. long. Flowers in cymes, greenish-white, about 1 in. in diameter. Fruit a round black berry, $\frac{2}{3}$ in. in diameter. Flowers in May and June.

Vandalur Hills. Rare. The ripe seeds are employed for clearing muddy water.

Gentianaceae

Herbs. Leaves opposite, rarely alternate. Calyx 4- to 7-lobed; the lobes usually imbricate in bud. Corolla-tube bell-shaped, funnel-shaped or cylindrical; lobes 4-7, twisted in bud (induplicate-valvate in *Limnanthemum*). Stamens as many as the corolla-lobes. Ovary 1- or 2-celled. Ovules usually numerous. Fruit a membranous capsule. Seeds many.

- | | | | | | | | | | |
|---|--|-----|-----|-----|-----|-----|-----|-----|-----------------------|
| 1 | Water-plants; leaves alternate; corolla-lobes induplicate-valvate in bud | ... | ... | ... | ... | ... | ... | ... | <i>Limnanthemum</i> . |
| | Land-plants; leaves opposite; corolla-lobes twisted in bud. | | | | | | | 2 | |
| 2 | Ovary 2-celled | ... | ... | ... | ... | ... | ... | ... | <i>Exacum</i> . |
| | Ovary 1-celled | ... | ... | ... | ... | ... | ... | 3 | |
| 3 | Corolla-lobes equal; stigma flat; flowers white | ... | ... | ... | ... | ... | ... | ... | <i>Enicostemma</i> . |
| | Corolla-lobes slightly unequal; stigma deeply 2-lobed; flowers pink (rarely white) | ... | ... | ... | ... | ... | ... | ... | <i>Canscora</i> . |

Limnanthemum, S. P. Gmel.

Water-plants floating or creeping. Leaves deeply cordate. Flowers yellow, clustered at the nodes. Calyx 4- to 7-partite. Corolla more or less wheel-shaped, 4- to 7-lobed; lobes induplicate-valvate in bud. Anthers attached to their filaments at the middle instead of at the base. Ovary 1-celled, the ovules attached to the walls. Fruit a capsule.

Limnanthemum cristatum, Griseb.

Pl. XX, C.

Stems petiole-like, with a single shortly-petioled leaf at the end (node). Leaves floating on water, circular in outline, deeply cordate, purplish, with green veins beneath, 2-4 in. in diameter. Petioles $\frac{1}{4}$ -1 in. long. Flowers numerous, in dense clusters. Calyx divided almost to the base. Corolla white, $\frac{3}{4}$ in. across; lobes obovate, with a longitudinal crest along the middle of each lobe. Capsule $\frac{1}{2}$ in. in diameter. Flowers December to March.

In the Cooum near Chetpat.

Exacum, Linn.

Herbs. Leaves opposite, entire, with 3 or more ribs. Flowers in cymes in the axils of leaves and at the ends of branches. Calyx deeply 4- to 5-lobed. Corolla wheel-shaped, blue, purple or white; tube short. Stamens 4 or 5, inserted at the throat of the corolla. Ovary 2-celled. Ovules many. Fruit a capsule.

Exacum pedunculatum, Linn.

An erect annual herb 6-18 in. in height. Stem 4-angled, much-branched above. Leaves almost stalkless, elliptic or lanceolate, 3-nerved, $1\frac{1}{4}$ -2 in. long. Flowers in much-branched cymes at the ends of branches. Flower-stalks long and rigid. Calyx 4-lobed; lobes with a strongly nerved wing on the back. Corolla blue; lobes 4, up to $\frac{1}{3}$ in. long. Capsule globose, shiny, $\frac{1}{6}$ in. in diameter. Flowers in February and March.

In paddy fields. Vandalur.

Enicostemma, Blume

Erect or slantingly-branching herbs. Leaves opposite, not stalked. Flowers small, not stalked, in clusters in the axils of leaves. Calyx deeply 5-lobed. Corolla tubular below and funnel-shaped above; lobes 5, overlapping in bud. Stamens 5, inserted at the middle of the corolla-tube. Filaments with a scale at the base. Ovary 1-celled. Ovules many. Style short. Fruit an ellipsoid capsule.

Enicostemma littorale, Blume

வெள்ளறுகு Pl. XX, D. நீலநிலிமி

A perennial herb 4 in. or more in height. Leaves linear-oblong, 3-nerved at base, the mid-nerve very prominent, glabrous, 1-2 in. long. Flowers not stalked, in clusters along the stem. Corolla white, $\frac{1}{4}$ in. long. Capsule ellipsoid, $\frac{1}{6}$ in. long. Flowers August to January.

A common weed. On the bund of the Nungambakam Tank. On the banks of the Buckingham Canal and the Cooum. Red Hills, on gravelly soil.

Canscora, Lamk.

Erect herbs. Flowers pink (in a few species white), arranged in dichotomous cymes. Calyx tubular, 4-toothed. Corolla-lobes 4, more or less unequal, imbricate and overlapping in bud. Stamens 4, 1 or 2 with longer filaments and larger fertile anthers, 3 or 2 with shorter filaments and sterile anthers. Ovary 1-celled. Stigma deeply 2-lobed. Capsule cylindrical.

Canscora sessiliflora, Roem. & Sch.

A small herb with winged stems. Leaves without stalks, ovate, obtuse, $\frac{1}{4}$ – $\frac{1}{2}$ in. long. Bracts narrow. Flowers without pedicels, standing in the forks of cymes. Calyx $\frac{1}{4}$ in. long. Corolla-tube $\frac{1}{4}$ in. long; lobes obovate, rose-coloured, $\frac{1}{4}$ in. long. Capsule oblong, as long as the calyx. Flowers December to March.

In wet places. Red Hills.

Hydrophyllaceae

Herbs. Leaves alternate. Flowers in cymes or racemes. Calyx 5-partite. Corolla 5-lobed; lobes imbricate in bud. Stamens 5, attached to the corolla-tube. Ovary 2-celled with 2 to many ovules. Styles 2. Fruit a capsule.

Hydrolea, Linn.

Flowers in short racemes or cymes at the ends of branches. Calyx divided nearly to the base. Corolla widely bell-shaped. Filaments usually dilated at the base. Ovules many. Seeds minute.

Hydrolea zeylanica, Vahl

Pl. XX, E.

A creeping annual herb. Stem succulent, glabrous, with air spaces. Leaves lanceolate, acute, glabrous, 1–2 in. long. Flowers numerous, on short lateral branches. Calyx covered with sticky hairs; lobes lanceolate, exceeding the capsule in length. Corolla very showy, bright blue, $\frac{1}{4}$ in. long. Styles 2, distinct, spreading. Capsule small, enclosed in the calyx. Flowers in February and March.

In paddy fields and on the margins of tanks.

Boraginaceae

Usually rough hairy herbs, shrubs or trees. Leaves alternate. Flowers in panicles or on one side of the branches of a reduced cyme imitating a spike or a raceme which is rolled up from the end and straightens as the blossoms expand (scorpioid). Calyx 5-partite. Corolla usually 5-lobed, with scales on the throat; lobes imbricate as a rule. Stamens as many as the corolla-lobes. Ovary 2-celled with 2 ovules in each cell, or 4-celled with 1 ovule in each cell. Style arising from the apex or between the lobes of the ovary. Fruit a drupe or dividing into 4 seed-like 1-seeded parts.

1	Ovary deeply 4-lobed	...	...	...	...	...	Trichodesma.
	Ovary not lobed or only slightly lobed	...	...	...	...	...	2
2	Styles 2; prostrate herbs	...	...	...	...	...	Coldenia.
	Styles single	...	...	...	...	...	3

- | | | | | | |
|---|--|-----|-----|-----|---------------|
| 3 | Style twice divided (4 branches) ; trees | ... | ... | ... | Cordia. |
| | Style not divided or divided once (2 branches) | ... | ... | ... | 4 |
| 4 | Stylar branches 2 ; trees or shrubs | ... | ... | ... | Ehretia. |
| | Styles not divided ; herbs | ... | ... | ... | Heliotropium. |

Trichodesma, R. Br.

Erect herbs covered with rough hairs. Leaves entire, the upper surface often covered with white tubercles each with a hair. Flowers standing singly in the axils of leaves. Calyx deeply 5-lobed, enlarged in fruit. Corolla-tube cylindrical or bell-shaped ; lobes 5, twisted. Stamens 5 ; anthers elongate-lanceolate, joined together into a cone, the connectives produced, tips sometimes twisted. Ovary 4-celled. Fruit pyramidal.

Corolla-tube as long as the lobes ; leaves lanceolate, covered with both wooly and rough hairs, up to 2 in. long indicum.

Corolla-tube much longer than the lobes ; leaves oblong, covered with rough but not wooly hairs ; up to 4 in. long amplexicaule.

Trichodesma indicum, R. Br.

An erect annual herb 6-18 in. high. Leaves lanceolate, somewhat obtuse at apex, hairy on both surfaces, more wooly beneath, not stalked, up to 2 in. long. Calyx deeply divided, roughly hairy, up to $\frac{1}{2}$ in. long ; segments hastate at base. Corolla pale blue, $\frac{1}{2}$ in. long ; limb thinly hairy inside ; lobes abruptly acuminate. Cone of the anthers large and very pointed, hairy. Ovary ovoid, glabrous. Fruits pyramidal, 4-ribbed. Flowers October to December.

Beside railway lines and on waste ground.

Trichodesma amplexicaule, DC.

PL. XXI, A.

An erect, coarsely hairy herb. Leaves oblong, cordate at base, obtuse, roughly hairy on both surfaces, wooly hair absent, up to 4 in. long, $\frac{5}{8}$ -1 in. broad. Calyx-lobes slightly hastate at base. Corolla-tube longer than the lobes ; lobes acute, light blue. Stamens separating, the tips pointed. Fruit pyramidal, 4-ribbed. Flowers in November and December.

In waste places. Nungambakam.

Coldenia, Linn.

Prostrate herbs covered with rough hairs. Leaves crisped. Flowers white or yellow, in the axils of leaves, not stalked. Calyx 4-partite. Corolla-lobes 4, imbricate in bud. Ovary slightly 4-lobed. Styles 2, distinct from the base. Fruit almost dry, of 4 one-seeded parts.

Coldenia procumbens, Linn.

செருப்படை

చెప్పరట్టాడు

A spreading herb lying quite flat on the ground. Younger parts white, silky. Branches numerous. Leaves obovate-oblong, coarsely serrate, hairy on both sides, tapering at base, $\frac{1}{2}$ - $1\frac{1}{2}$ in. long. Flowers pale yellow. Calyx hairy. Corolla pale yellow. Fruit beaked, hairy, ultimately separating into 4 beaked, 1-seeded parts. Flowers at all seasons but the driest.

On moist ground. In dried tanks and rice fields. The plant is used in medicine.

Cordia, Linn.

Trees or shrubs. Leaves alternate. Flowers in branched cymes, some without ovary. Calyx cup-shaped, teeth obscure. Corolla usually white; lobes 4-8, imbricate. Stamens as many as the corolla-lobes. Ovary 4-celled. Ovules 1 in each cell. Style twice-branched. Fruit a drupe with sticky pulp.

1 Flowers white, small; corolla-tube not longer than the calyx 2

Flowers orange-scarlet, large; corolla-tube longer than the

calyx Sebestena (cultivated).

2 Leaves ovate-circular, up to 5 in. in diameter; the basal pair

of nerves opposite; stamens 5 obliqua.

Leaves oblong-lanceolate, up to 3 in. long; basal pair of

nerves not opposite; stamens 4 Rothii.

Cordia Sebestena, Linn.

A small tree. Leaves ovate, rough, 4-6 in. long. Cymes of showy scarlet flowers appearing in October and November.

A native of the West Indies occasionally cultivated in gardens. Museum compound.

Cordia obliqua, Willd. (*Cordia myxa*, Linn.)

பெருநறுவுளி

A moderate-sized tree. Bark thick, rough with shallow longitudinal wrinkles and furrows. Leaves broadly ovate, distantly toothed, glabrous, nerves 4 or 5 pairs. Flowers in large panicles in the axils of leaves or at the ends of branches, small, white. Fruit ovoid, cream-coloured, with a sharp point at apex, $\frac{1}{2}$ -1 in. long. Flowers in March and April. Fruit ripens in July.

Both wild and cultivated. Pachaiyappa's Hostel compound. The fruit is edible.

Cordia Rothii, Roem. & Sch.

சிறுநறுவுளி Pl. XXI, B.

A small tree. Bark longitudinally furrowed. Leaves more or less opposite, oblong-ob lanceolate, glabrous on both surfaces, stiff, entire, up to 3 in. long. Flowers small, in loose panicles in the axils of leaves and at the ends of branches. Stamens 4. Drupe ovoid, acute, with a minute sharp point at apex, yellowish or brownish, about $\frac{1}{2}$ in. long. Flowers in April. Fruit ripens in July and August.

Occasionally met with in jungly places near the city. Near Kodambakam. Pachaiyappa's Hostel compound.

Ehretia, Linn.

Trees or shrubs. Flowers small, usually white, in cymes or panicles or few together. Calyx small, 5-partite. Corolla with a short tube and 5 imbricate lobes. Ovary 2-celled with 2 ovules in each cell, or 4-celled with 1 ovule in each cell. Styles 1 or 2. Fruit a drupe.

- | | | | | | |
|---|---|-----|-----|------------|--------------|
| 1 | Styles 2, or 1 divided almost to the base | ... | ... | ... | microphylla. |
| | Styles single, divided less than half-way down | ... | ... | 2 | |
| 2 | Leaves elliptical, their halves equal | ... | ... | ... | ovalifolia. |
| | Leaves ovate-oblong, their halves often unequal | ... | ... | pubescens. | |

Ehretia microphylla, Lamk. (*Ehretia buxifolia*, Roxb.)

Pl. XXI, C.

A small shrub 3-4 ft. high. Leaves 2 or 3 arising at each node, without stalks, obovate, wedge-shaped at base, bristly and shining above, pale below, 3- to 5-toothed at apex or not, tough, up to 1 in. long. Flowers 1 or 2 together in the axils of leaves, small, white. Fruit globose, scarlet, $\frac{1}{2}$ in. in diameter. Flowers at various parts of the year.

In scrub jungle. Guindy Park. Pallavaram. Avadi. Vandalur. Tambaram. Ennur on the northern side of the bridge.

Ehretia ovalifolia, Wt.

A small branching tree. Young parts softly hairy. Leaves elliptic, obtuse at apex, entire, hairy on both surfaces, main nerves 4 or 5 pairs, up to $2\frac{1}{2}$ in. long, $1\frac{1}{4}$ in. broad. Flowers small, white, in corymbs mostly at the ends of branches. Calyx hairy on the outside. Style 2-branched near the top. Fruit red, nearly $\frac{1}{6}$ in. in diameter. Flowers in August and September. Fruit ripens in October and after.

Vandalur Hills.

The locality recorded for this species in Gamble's Flora of the Presidency of Madras is "Western Ghats, East side, from Coimbatore southwards, at low levels." Mr. Fischer in his Forest Flora of East-Central Madras does not include this plant. Identified for us at Coimbatore.

Ehretia pubescens, Benth. (*Ehretia laevis*, Roxb., var. *pubescens*, C. B. Clarke)

A shrub up to 20 feet high. Younger parts covered with soft hairs. Bark grey. Leaves ovate-oblong, entire, obtuse, 5- to 7-nerved, densely covered with soft hairs on both surfaces when young, the upper surface becoming less hairy with age, up to $2\frac{3}{4}$ in. broad. Petiole up to $\frac{1}{3}$ in. long. Flowers white, in corymbs at the ends of branches. Calyx softly hairy on the outside. Berry becoming black on ripening, $\frac{1}{4}$ in. in diameter. Flowers in July and August soon after the appearance of the young leaves.

Vandalur Hills.

The locality for this species according to Gamble is "Deccan, hills of Cuddapah and Nellore up to 3,000 ft. East slopes of the Anamalais." The specimen was identified for us at Calcutta.

Heliotropium, Linn.

Herbs or shrubby herbs. Flowers small, white or pale blue, on one side of the branches of a reduced cyme resembling a spike or raceme which is rolled up from the end and straightens as the flowers mature. Corolla-tube cylindrical; lobes 5, usually spreading when in flower. Stamens 5, included by the corolla-tube. Ovary completely or incompletely 4-celled. Ovules 1 in each cell. Fruit dry, ultimately splitting into 4 distinct nut-like parts.

1	Erect herbs	...	...	...	...	...	...	2
	Prostrate herbs	...	...	...	...	...	...	4
2	Leaves ovate, up to 4 in. long	...	...	...	...	...	...	indicum.
	Leaves linear, under $1\frac{1}{2}$ in. long	...	...	...	...	...	...	3
3	Bracts small, linear; leaves almost glabrous above; stem sparsely hairy	...	...	...	...	...	...	zeylanicum.
	Bracts rather large, lanceolate; leaves densely hairy on both surfaces; stem densely hairy	...	...	...	...	...	...	bracteatum.
4	Leaves fleshy; corolla-throat yellow	...	...	...	...	...	...	curassavicum.
	Leaves not fleshy; corolla-throat not yellow	...	...	...	...	...	...	5
5	Whole plant white with woolly hairs	...	...	...	...	...	...	supinum.
	Plants not woolly	...	...	...	...	...	...	6
6	Leaves obovate to spatula-shaped, densely covered with silky hairs	...	...	...	...	...	...	ovalifolium.
	Leaves linear-lanceolate, covered with rough rigid hairs	...	...	...	...	...	...	scabrum.

Heliotropium indicum, Linn.

தேள்கொடுக்குபூண்டு

Pl. XXI, D.

நா. ௪௦௦

A coarse annual herb 2 ft. in height. Leaves ovate, obtuse, margins wavy or slightly toothed, somewhat cordate at base, the two halves often unequal at base, decurrent, hairy on both surfaces, 2-4 in. long. Spikes 2-6 in. long. Flowers numerous, 2-ranked, pale blue, small. Fruit deeply 2-lobed, each lobe containing 2 hard, beaked, 1-seeded, nut-like parts. Flowers July to March.

In waste places.

Heliotropium zeylanicum, Lamk.

An erect herb with fairly long branches, 1-3 ft. high. Leaves linear, almost sessile, acute, hairy on the upper surface, very sparsely hairy on the lower surface, about 1 in. long. Spikes over 2 in. long. Flowers white, not crowded. Fruit consisting of 4 nut-like parts. Flowers in August and September.

High Court compound.

Heliotropium bracteatum, R. Br.

A slender erect hairy herb reaching 2 ft. in height. Leaves linear-lanceolate, slightly acute at apex, densely hairy on both surfaces, about 1 in. long. Spikes shortened. Bracts fairly prominent. Fruit of 4 nut-like parts. Flowers in December.

Ennur, in dry situations along the railway line.

Heliotropium curassavicum, Linn.

Pl. XXI, E.

A glabrous prostrate herb with ascending branches. Leaves spatula-shaped or linear-lanceolate, pale, almost veinless, up to $1\frac{1}{2}$ in. long. Spikes in pairs. Flowers white or bluish. Flowers in the rainy weather and after. A common weed of salt marshes.

Ennur. On the banks of the canal in the city. Introduced from the West Indies and run wild.

Heliotropium supinum, Linn.

A prostrate spreading herb. Stems numerous. Leaves elliptic-ovate, more or less crenate, obtuse, pleated longitudinally, covered with soft hairs on both sides, nerves impressed, $\frac{1}{2}$ -1 in. long. Flowers arranged in spike-like cymes. Calyx very hairy on both sides. Lobes very short. Corolla high up in the flower. Lobes very short. Fruit usually of 2 nut-like parts, covered with tubercles. Flowers in February and March.

In fields near Guindy.

Heliotropium ovalifolium, Forsk.

A prostrate herb with a number of stems arising from the upper part of the root. Stems and branches ascending, clothed with silky hairs. Leaves with a sharp point at apex, $\frac{1}{2}$ -1 in. long. Spikes 2-branched, 2-4 in. long. Flowers 2-ranked, white. Calyx divided almost to the base, hairy, remaining on the plant even after the nut-like parts of the fruit have fallen away.

Common in fallow fields.

Heliotropium scabrum, Retz.

A much-branched herb with many stems arising from the thickened root-stock. Stems and branches hairy, spreading on the ground and not ascending. Leaves lanceolate, covered with rough hairs on both surfaces, about $\frac{1}{2}$ in. long, sometimes reaching $\frac{3}{4}$ in. in length. Flowers in short spikes less than 1 in. in length, in the axils of leaves. Bracts conspicuous, leaf-like. Calyx hairy. Corolla white, $\frac{1}{4}$ in. long, pleated and having minute teeth between the lobes. Nut-like parts 4, bristly. Flowers July to November.

In sandy places.

Var. *Wallichii* (*Heliotropium marifolium*, var. *Wallichii*, C. B. Clarke)

Branches ascending more abruptly. Leaves narrower. Spikes longer.

Common along railway lines.

Convolvulaceae

Herbs or shrubs usually with twining habit. Leaves alternate (absent in *Cuscuta*). Flowers generally showy. Calyx of 5 imbricate sepals. Corolla bell-shaped, funnel-shaped or flat and circular or salver-shaped. Limb of corolla not toothed, shortly-lobed, often folded into pleats in bud. Stamens 5. Ovary usually 2- to 4-celled, occasionally 1-celled. Ovules 1 or 2 in each cell. Fruit a capsule or a berry.

1	Leafless, parasitic, twining herbs	...	...	...	...	<i>Cuscuta</i> , p.191.
	Leafy, non-parasitic plants	...	...	...	...	2
2	Styles 2	...	...	...	...	3
	Styles single	...	...	...	...	4
3	Corolla-lobes imbricate	...	...	...	...	<i>Cressa</i> , p.191.
	Corolla-lobes not imbricate	...	...	...	...	<i>Evolvulus</i> , p.192.
4	Fruit not breaking open when mature	...	...	...	...	5
	Fruit breaking open when mature	...	...	...	...	6
5	Corolla salver-shaped; stigmatic lobes linear-oblong	...	...	...	...	<i>Rivea</i> , p.192.
	Corolla funnel-shaped; stigma of two spherical lobes	...	...	...	...	<i>Argyreia</i> , p. 193.

- | | | | | | | | |
|---|--|-----|-----|-----|-----|-----|---------------------|
| 6 | Ovary 1-celled | ... | ... | ... | ... | ... | Hewittia, p. 193. |
| | Ovary 2- to 4-celled | ... | ... | ... | ... | ... | 7 |
| 7 | Corolla salver-shaped | ... | ... | ... | ... | ... | 8 |
| | Corolla bell-shaped or funnel-shaped | ... | ... | ... | ... | ... | 9 |
| 8 | Corolla crimson, not more than 2 in. long | ... | ... | ... | ... | ... | Quamoclit, p.193. |
| | Corolla white or purplish, over 3 in. long | ... | ... | ... | ... | ... | Calonyction, p.194. |
| 9 | Pollen grains covered with small spines; the 5-coloured bands on the corolla-lobes clearly defined by 2 prominent coloured lines | ... | ... | ... | ... | ... | Ipomaea, p.194. |
| | Pollen grains smooth; the 5 bands rarely clearly distinguishable from the intervening spaces | ... | ... | ... | ... | ... | Merremia, p.198. |

Cuscuta, Linn. Dodder

Leafless annual herbs with thread-like yellowish stems. Flowers small, arranged in clusters. Corolla-lobes imbricate. Ovary 2-celled. Ovules 2 in each cell. Styles 1 or 2.

Cuscuta chinensis, Lamk.

Pl. XXII, B. నీలమొలకలు

Stems thread-like, often forming a tangled mass. Flowers small, yellowish. Fringed scales present at the base of filaments. Flowers in October and November.

Growing on Ipomaea Pes-caprae on the seashore at San Thome. Cassytha filiformis, of the family Laurace, occurring on shrubs in scrub jungle near Madras, is apt to be mistaken for this plant. Mr. Fischer in his note on this genus observed that he had not observed Cuscuta in the Madras Presidency. What he thought to be Cuscuta proved to be Cassytha on examination.

Cressa, Linn.

Small erect herbs covered with short grey hairs. Leaves small, entire. Flowers small. Corolla-lobes imbricate. Ovules 2 in each cell. Styles 2. Fruit 1- to 4-seeded.

Cressa cretica, Linn.

Pl. XXII, C. ఉప్పు తొన

A short slender plant not more than a foot high, usually much shorter. Stem quite stiff. Stem and leaves very hairy. Leaves ovate-lanceolate, $\frac{1}{4}$ in. long. Flowers white, in small clusters in the axils of the upper leaves, carried on much reduced stalks. Capsule small, with a single seed. Flowers December to March.

Abundant at Ennur along the backwater near the salt pans. Occasionally found as a weed in Madras.

Evolvulus, Linn.

Plants usually prostrate, never twining. Flowers small. Corolla funnel-shaped or flat and circular in outline. Ovary 2-celled. Cells 2-seeded. Styles 2, each 2-cleft.

Flowers blue; leaves elliptic-oblong, clothed with silky

hairs; stems not rooting at the nodes alsinoides.

Flowers white; leaves circular-oblong, glabrous; stems

rooting at the nodes nummularius.

Evolvulus alsinoides, Linn.

விஷ்ணுகிரந்தி Pl. XXII, D. విష్ణుకాంతము

A prostrate herb having a perennial underground stem. Leaves up to $\frac{3}{4}$ in. long. Flowers light blue, standing singly or 2 together. Flowers at all seasons.

Very common in grassy places except in the driest months. Very largely used in Indian medicine, chiefly as a febrifuge.

Evolvulus nummularius, Linn.

A prostrate loosely spreading herb with wiry branches covered with soft hairs. Leaves entire, flatly obtuse at apex, cordate at base, thin, $\frac{5}{8}$ in. long. Flowers standing singly in the axils of leaves, small. Calyx slightly hairy. Corolla white, $\frac{1}{6}$ in. long. Flowers August to December.

Growing in patches in the Agri-Horticultural Society's garden. On road-sides and in gardens in Teynampet. This plant is a native of the West Indies. I first collected it in Madras in August, 1925. Some specimens were found growing in the compound of Pachaiyappa's Hostel, Chetpat, in 1927. It appeared in Calcutta some years ago.

Rivea, Choisy

Straggling or climbing shrubs. Leaves on long stalks, acuminate at apex, covered with short silky hairs beneath. Flowers 1-3 on a stalk. Corolla large, white, salver-shaped; tube narrow, cylindrical; lobes of the limb rounded, folded into pleats. Ovary 4-celled with 4 ovules. Fruit dry, often 1-celled. Seeds surrounded by mealy pulp.

Rivea hypocrateriformis, Choisy

பொத்திக்கீரை வீட்டி

A climbing shrub. Leaves broadly ovate, shallowly cordate at base, softly hairy beneath when young, 2 in. long and 3 in. broad. Flowers standing singly. Corolla large

white, faintly fragrant, opening at night and closing at sunrise, $2\frac{1}{2}$ in. long. Fruit breaking open irregularly. Flowers February to May and probably in other months also.

Hills at Pallavaram. Scrub jungle at Avadi. Abundant at the foot of the hills at Vandalur.

Argyreia, Lour.

Climbing shrubs. Leaves usually softly hairy beneath. Flowers disposed in cymes. Sepals leathery. Corolla tubular, funnel-shaped, large and showy. Ovary 4-celled. Ovules 4. Stigma consisting of a double spherical head. Fruit a dry or fleshy berry. Seeds embedded in mealy pulp.

Argyreia cymosa, Sweet

పాలసముద్ర

A climbing, not very shrubby plant. Leaves fairly large, ovate, cordate at base, acuminate at apex, softly hairy, carried on long stalks, 2-4 in. in diameter. Flowers collected in dense heads at ends of branches. Sepals slightly enlarged in fruit, about $\frac{1}{3}$ in. long. Corolla tubular, funnel-shaped, pale pink, hairy outside, 2 in. long. Berry $\frac{3}{4}$ in. in diameter. Flowers November to January.

Common in hedges at Adyar.

Hewittia, Wt. & Arn.

Twining herbs covered with soft hairs. Flowers standing singly in the axils of leaves. Calyx of unequal sepals, the 3 outer ones enlarged in fruit. Corolla widely bell-shaped, softly hairy without. Ovary covered with long white silky hairs, 1-celled. Ovules 4. Fruit a 3-seeded capsule.

Hewittia bicolor, Wt. & Arn.

Stem twining or lying prostrate on the ground. Leaves ovate, angled or palmately lobed, cordate at base, more or less softly hairy on both surfaces, up to 4 in. long. Corolla pale yellow with a purple eye, about 1 in. long. Flowers August to January. On hedges at Teynampet. Occasional along the railway line near Chetpat.

Quamoclit, Moench.

Climbing herbs with glabrous stems. Flowers arranged in cymes in the axils of leaves. Corolla salver-shaped. Stamens much drawn out, unequal. Ovary 4-celled. Ovules 4. Stigma consisting of a double spherical head.

Leaves ovate, entire or lobed phoenicia.

Leaves pinnately dissected; the segments linear pinnata.

Quamoclit phoenicia, Choisy (*Ipomaea coccinia*, Linn.)

A weak slender twiner. Leaves ovate, cordate at base, entire or lobed, 2-4 in. long. Flowers in few-flowered cymes. Corolla crimson, over 1 in. long. Capsule roundish, over $\frac{1}{4}$ in. in diameter. Flowers October to March.

A Tropical American species that has escaped from cultivation. Nungambakam.

Quamoclit pinnata, Boj. (*Ipomaea Quamoclit*, Linn.) Needle-creeper

காசி ரத்னம்

A slender glabrous twiner. Leaves dissected into numerous slender thread-like segments. Flowers 1 or 2 together. Corolla scarlet, over 1 in. long. Fruit about $\frac{1}{4}$ in. in diameter. Flowers in the rainy weather.

This species, like the last, has been introduced from Tropical America. It is grown in gardens and is occasionally found as an escape. A white-flowered variety is less common than the scarlet form.

Calonyction, Choisy

Large herbaceous climbers. Stems often warty. Leaves large, cordate, entire. Flowers in few-flowered cymes in the axils of leaves. Corolla large, salver-shaped; tube narrow, long, cylindrical; limb pleated. Ovary 2-celled, 4-ovuled. Seeds 4, glabrous.

Calonyction muricatum, G. Don. (*Ipomaea muricata*, Jacq.)

மூக்கத்திக்காய் முகத்தி காய்

Stems warty. Leaves broadly ovate, acuminate, cordate at base, glabrous, 3-5 in. in diameter. Flowers 1-5 on a peduncle. Corolla rose-purple, 2-3 in. long. Capsule with a point at apex, $\frac{2}{3}$ in. in diameter. Flowers January to March.

Cultivated in gardens. The thickened flower-stalks are used for curries. Occasionally found run wild.

Calonyction Bona-nox, Boj. (*Ipomaea Bona-nox*, Linn.) The Moon Flower

A large climber. Leaves large, cordate, with a small pointed apex. Flowers large, white, sweet-scented, opening at night. Occasionally found as an escape.

Ipomaea, Linn.

Twining or prostrate herbs. Leaves entire, lobed or divided. Sepals equal or unequal, often enlarged in fruit. Corolla bell-shaped or funnel-shaped. Pollen-grains

covered with spinules (seen under a magnifying glass of good power or the low power of a microscope). Capsule 4- to 6-seeded.

- | | | | |
|----|---|--------|---------------|
| 1 | Leaves compound, having 5 leaflets | ... .. | quinquefolia. |
| | Leaves simple, lobed (occasionally the lobes very nearly divided to the base and so appearing to be compound) | ... 2 | |
| 2 | Outer sepals cordate at base; inner ones usually so | ... .. | calycina. |
| | Sepals not cordate at base | ... .. | 3 |
| 3 | Leaves entire | ... .. | 4 |
| | Leaves lobed or deeply cut | ... .. | 9 |
| 4 | Flowers in sessile heads | ... .. | hispida. |
| | Flowers in panicles | ... .. | 5 |
| 5 | Aquatic plants or plants living in wet places and rooting in the mud | ... .. | 6 |
| | Land-plants | ... .. | 7 |
| 6 | Leaves lanceolate or triangular; sepals nearly equal | ... | reptans. |
| | Leaves ovate; outer sepals shorter | ... .. | repens. |
| 7 | Seeds covered with velvety hairs; the 2 outer sepals shorter; slender climbers | ... .. | 8 |
| | Seeds covered with long silky hairs; sepals equal; a shrubby climber | ... .. | staphylina. |
| 8 | Flowers pink with purple tube | ... .. | sepiaria. |
| | Flowers yellow or white with purple tube | ... .. | obscura. |
| 9 | Leaves camel-foot in shape; a seaside plant | ... .. | Pes-caprae. |
| | Not as above | ... .. | 10 |
| 10 | Leaves 3-lobed | ... .. | hederacea. |
| | Leaves more than 3-lobed | ... .. | 11 |
| 11 | Leaves 5- to 9-lobed; lobes entire; flowers grouped in heads; corolla about 1 in. long | ... .. | Pes-tigridis. |
| | Leaves almost divided into 5 leaflets; flowers standing singly; corolla less than 1/2 in. long | ... .. | dissecta. |

Ipomaea quinquefolia, Griseb.

An annual herbaceous climber. Stem covered with stiff bristly hairs. Leaves palmately compound, having 5 leaflets. Common petiole about 1 in. long, sometimes less. Leaflets elliptic-lanceolate, wedge-shaped at base, irregularly serrate, pointed at apex, standing on short stalks, rather hairy on both surfaces, 1-1½ in. long. Flowers in 1- or 2-flowered cymes in the axils of leaves. Calyx covered with bristly hairs, in fruit nearly

1 in. long. Corolla white, about 1 in. long. Capsule about $\frac{1}{3}$ in. long. Seeds covered with velvety hairs. Flowers in the rainy weather.

Adyar, near the Theosophical Society's Gardens. It is a native of the West Indies. I first noticed it in 1925. It is one of the most recent cases of a foreign plant running wild in Madras.

Ipomaea calycina, C. B. Clarke

A slender twiner. Stem softly hairy. Leaves ovate, cordate or sagitate, entire, acute, sparsely hairy, 2-3 in. long. Flowers in 1- or 2-flowered cymes. Sepals in fruit sagitate. Corolla white, $\frac{1}{2}$ in. long. Capsule $\frac{1}{4}$ in. long. Seeds covered with silky hairs. Flowers in December and January.

Near the Poonamallee Road about 8 miles from Madras. The locality recorded for this species in Gamble's Flora is W. Ghats, Wynaad, hills of Coimbatore, at 1,000-3,000 ft. The occurrence of this species at sea level near Madras is noteworthy. The specimen was identified at Calcutta.

Ipomaea hispida, Roem. & Sch. (*Ipomaea eriocarpa*, R. Br.)

Stem twining. Leaves ovate-triangular, sagitate or cordate at base, acute, hairy on both surfaces, up to $2\frac{1}{2}$ in. long. Flowers in 1- or 2-flowered heads. Flower-stalks almost absent. Corolla small, pink. Capsule hairy. Flowers November to January.

Near Basin Bridge. Vandalur Hills.

Ipomaea reptans, Poir. (*Ipomaea aquatica*, Forsk.)

A water-plant with hollow stems trailing on mud or floating. Leaves ovate or lanceolate, cordate or hastate at base, carried on long stalks, 3-5 in. long. Flowers in few-flowered cymes. Corolla pink, about 2 in. long. Capsules ovoid, glabrous, $\frac{1}{3}$ in. long. Seeds 2-4. Flowers in the rainy weather.

This species was once common in Madras but is becoming quite scarce. Many other aquatic plants like *Utricularia* and *Isoetes* are also disappearing from Madras as a result of the draining of tanks.

Ipomaea repens, Lamk. (*Ipomaea Beladamboe*, Roem. & Sch.)

An extensively trailing plant of wet places. Leaves broadly ovate, cordate at base, obtuse or slightly notched at apex, glabrous, up to 4 in. in diameter. Flowers in many-flowered cymes. Corolla large, purplish, up to 2 in. long. Capsule globose, $\frac{1}{3}$ in. in diameter. Seeds 4, glabrous. Flowers September to January.

On the borders of tanks near the city. On the sides of the backwater at Ennur.

Ipomaea staphylinia, Roem. & Sch.

ஓணங்காடி

A large straggling or climbing shrub. Leaves ovate, somewhat cordate at base, obtuse or slightly notched at apex, prominently 8- to 10-ribbed, glabrous, up to 5 in. long. Flowers in loose panicles. Corolla tubular, bell-shaped, white, purplish inside, over $\frac{1}{2}$ in. long. Capsule glabrous, $\frac{1}{3}$ in. long. Seeds black, covered with white hairs. Flowers at the end of the rainy season.

At the foot of Pallavaram Hills.

Ipomaea sepiaria, Koen.

A slender twining herb. Leaves ovate, with cordate or hastate base, glabrous, up to $2\frac{1}{2}$ in. long. Flowers 1 or 2 together on a long peduncle. Corolla pink, about $1\frac{1}{2}$ in. long. Capsule ovoid, 2-to 4-seeded, $\frac{1}{4}$ in. long, covered with velvety hairs. Flowers at all seasons except the driest.

Very common in hedges almost everywhere.

Ipomaea obscura, Ker-Gawl.

சிறுதாளி

A climbing or trailing glabrous annual herb. Leaves thin, broadly ovate, cordate at base, slightly acuminate at apex, covered with short soft hairs, up to 3 in. in diameter. Cymes 1- or 2-flowered, on long peduncles. Corolla funnel-shaped, white, about 1 in. long. Capsule $\frac{1}{3}$ in. long. Seeds 2-4, velvety. Flowers in December and January.

Near Basin Bridge.

Ipomaea Pes-caprae, Sweet (*Ipomaea biloba*, Forsk.)

முயல்காதுலை Pl. XXII, E. చెవులపిల్లిక, బలబండిక

An extensively creeping herb rooting at the nodes. Leaves deeply 2-lobed, thick, glabrous, up to 2 in. long, 3-5 in. broad. Flowers 1-3 on a peduncle. Corolla pink, funnel-shaped, 2 in. long. Capsule ovoid, glabrous, $\frac{1}{2}$ in. long. Seeds with golden-brown pubescence. Flowers in the rainy and cold weather.

Very common on sandy tracts near the sea. Also found inland in dried river-beds. Chetpat. This is the most important sand-binding plant.

Ipomaea hederacea, Jacq.

ஈஹியூல

A slender climber. Stems covered with backward pointing hairs. Leaves palmately 3-lobed, ovate, cordate at base, lobes acuminate, sparsely hairy, 2-5 in. in diameter. Flowers 1-3 on a peduncle. Corolla blue or pink, $1\frac{1}{2}$ -2 in. long. Seeds glabrous. Flowers in the rainy weather.

Very common in waste places near villages. This is believed to have originally come from Tropical America.

The form with entire ovate cordate leaves (var. *integrifolia*) also occurs in Madras in similar situations.

Ipomaea Pes-tigridis, Linn.

A hairy annual, climbing or spreading on the ground. Leaves 5- to 9-lobed (sometimes 3-lobed), cordate at base, hairy on both surfaces, 2-4 in. in diameter. Flowers 3 or more arranged in a head on a common peduncle. The 2 outer sepals broader than the inner. Corolla white, tubular or bell-shaped, sometimes pale pink, 1 in. long. Capsule glabrous. Flowers November to January.

Very common on waste ground.

Ipomaea dissecta, Willd.

An annual glabrous prostrate herb with a number of spreading branches. Leaves so deeply divided as to appear like compound leaves. Lobes 3-7, linear-lanceolate, serrate. Flowers standing singly as a rule on peduncles $\frac{1}{2}$ -1 $\frac{1}{2}$ in. long. Corolla white, about $\frac{1}{2}$ in. long. Ovary 3-celled. Capsule glabrous. Seeds 3, pubescent.

"On sands near the coast" I have included this species on the authority of Mr. Fischer. I have not collected this plant but it may be expected in our area.

Ipomaea Batatas, Poir. The Sweet Potato

வள்ளிக்கிழங்கு పెనుసున్న

Frequently cultivated near Madras.

Merremia, Dennst.

Climbing herbs or shrubs, sometimes prostrate. Calyx of 5 nearly-equal sepals. Corolla bell-shaped or funnel-shaped, the vertical coloured bands defined by darker lines. Limbs pleated. Pollen grains not covered with spinules. Ovary 2- to 4-celled. Stigma consisting of a double spherical head. Seeds 4.

- | | | | | |
|---|--|-----|-------------|-----------|
| 1 | Leaves palmately compound, having 5 leaflets | ... | ... | aegyptia. |
| | Leaves simple | ... | ... | 2 |
| 2 | Leaves palmately divided very nearly to the base | ... | dissecta. | |
| | Leaves entire, toothed or lobed | ... | 3 | |
| 3 | Inner sepals 2-lobed at the apex; leaves kidney-shaped | ... | emarginata. | |
| | Inner sepals not 2-lobed at the apex | ... | 4 | |
| 4 | Flowers 1-3 on axillary peduncles | ... | tridentata. | |
| | Flowers many in dense racemose cymes | ... | chryseides. | |

Merremia aegyptia, T. Cooke (*Ipomaea pentaphylla*, Jacq.)

A twining annual herb. Stems sparsely hairy. Leaflets 5, broadly lanceolate, acuminate, acute at base, sparsely hairy, 2-4 in. long. Flowers white, in racemose cymes. Corolla 1 in. long. Capsule glabrous, $\frac{1}{2}$ in. long. Flowers November to January.

Occasionally found growing in hedges.

Merremia dissecta, Hallier (*Ipomaea sinuata*, Ort.)

A twining herb with glabrous stems. Leaves palmately divided or parted into 7 segments. Lobes lanceolate, acute, pinnately cut into smaller lobes, glabrous. Flowers in long-peduncled, few-flowered cymes. Corolla white with a pink throat, $1\frac{1}{2}$ in. long. Seeds large, glabrous. Flowers August to December.

Adyar. Teynampet. This plant, believed to be a native of Tropical America and the West Indies, is now naturalized here.

Merremia emarginata, Hallier (*Ipomaea reniformis*, Choisy)

எலிக்கா துணை

A creeping herb rooting at the nodes. Leaves kidney-shaped or ovate-cordate, broader than long, toothed, up to $\frac{3}{4}$ in. long. Flowers 1-3 in the axils of leaves. Sepals hairy, the 3 inner ones 2-lobed at apex. Corolla yellow, $\frac{1}{4}$ in. long. Flowers in the rainy and cold weather.

Very common in damp places.

Merremia tridentata, Hallier (*Ipomaea tridentata*, Roth)

A slender prostrate glabrous herb. Leaves oblong-obovate, often deeply emarginate, 3-toothed at apex, dilated at the base into 2 lobes. Flowers 1-3 on a short peduncle. Corolla pale yellow, less than $\frac{1}{2}$ in. long. Seeds 3-angled. Flowers in the rainy weather.

A very common weed of waste places.

Merremia chryseides, Hallier (*Ipomaea chryseides*, Ker-Gawl.)

A twining glabrous herb. Leaves ovate, slightly acuminate, entire or toothed, cordate at base, glabrous, 1-3 in. long. Flowers small, numerous, in dense racemose cymes in the axils of leaves. Corolla yellow, $\frac{1}{3}$ in. long. Limb with 5 distinct triangular lobes. Capsule transversely wrinkled, $\frac{1}{4}$ in. long. Seeds 3-angled, softly hairy. Flowers December to March.

Near Poonamallee.

Solanaceae

Herbs or shrubs. Leaves alternate, sometimes unequal pairs found on the upper parts of the stem. Calyx 5-lobed or 5-toothed, persistent and often enlarging in fruit. Corolla funnel-shaped, bell-shaped or wheel-shaped, 5-lobed or almost entire, often pleated.

Stamens 5, attached to the corolla-tube. Anthers often opening by pores. Ovary 2-celled, the partition wall not reaching quite to the top. Fruit a many-seeded berry or capsule. Seeds circular, thin.

1	Fruit a capsule	...	...	...	...	...	...	2
	Fruit a berry	...	...	...	...	...	...	3
2	Flowers standing singly in the axils of leaves	...	...	...	...	...	...	Datura.
	Flowers in panicles or racemes at ends of branches	...	...	...	...	...	...	Nicotiana.
3	Anthers longer than filaments, arranged in the form of a cone	...	...	...	...	...	...	4
	Anthers not longer than filaments, not arranged in a cone	...	...	...	...	...	...	5
4	Anthers opening by pores at their apices; leaves simple, lobed	...	...	...	...	...	...	Solanum.
	Anthers opening longitudinally, their tips empty; leaves pinnately cut	...	...	...	...	...	...	Lycopersicum (cultivated).
5	Calyx in fruit small	...	...	...	...	...	...	Capsicum.
	Calyx in fruit much enlarged	...	...	...	...	...	...	Physalis.

Datura, Linn. Thorn Apple

Shrubby herbs. Flowers large. Calyx-tube cylindrical, 5-lobed, the upper part falling away leaving the lower portion in fruit. Corolla with a long tube, funnel-shaped; limb pleated, shortly 5- to 10-lobed. Stamens 5, attached near the base of the corolla-tube. Stigma 2-lipped. Capsule round, 4-celled except near the top where it is divided into two, bursting open irregularly or opening along 4 lines.

Flowers white or white and purple; corolla 5-toothed;	
capsule covered with short spines	... fastuosa.
Flowers white tinged with green; corolla 10-toothed;	
capsule covered with long slender spines	... Metel.

Datura fastuosa, Linn.

கரு ஊமத்தை Pl. XXIII, B. நல்ல காய்க்காய்

A large annual plant often with zigzag stems. Leaves ovate, acute, entire or with a few large teeth or lobes, nearly glabrous, up to 8 in. long. Calyx about 3 in. long. Corolla purple outside, sometimes double, up to 7 in. long. Capsules hanging down on curved pedicels, sub-globose, supported on the reflexed base of the bottom part of the calyx, covered with numerous straight sharp prickles $1\frac{1}{4}$ in. in diameter. Flowers August to January.

Common in waste places. The seeds are poisonous. The flowers, leaves and the roots are used in medicine.

Var. *alba*, C. B. Clarke

ஊட்டத்தை கெடுத்து

Flowers white, rather smaller than those of *Datura fastuosa*, proper. The flowers are never double. Seeds poisonous.

More common than the preceding.

Datura Metel, Linn.

An annual herb. Leaves ovate-lanceolate, acute, entire or slightly toothed, covered with short soft hairs, up to 4 in. long. Calyx large, tubular. Corolla white tinged with green, 10-toothed, about 1 in. long. Capsule covered with long slender spines. Flowers in the rainy months. Seeds poisonous.

A native of Tropical America. Occasionally met with in Madras as an escape.

Nicotiana, Linn.

Narcotic herbs. Calyx tubular, bell-shaped, 5-cleft. Corolla funnel-shaped or salver-shaped, usually with a long tube, the pleated border 5-lobed. Stigma shaped like a head. Capsule 2-celled. Seeds minute.

Leaves oblong, up to 1 foot long; flowers in dense, many-flowered corymbs at ends of branches *Tabacum*.

Leaves lanceolate, under 6 in. long; racemes few-flowered, in the axils of leaves or at ends of branches *plumbaginifolia*.

Nicotiana Tabacum, Linn. The Tobacco Plant

புகை இலை பாக்கு

An annual herb. Leaves large, oblong or elliptic, winged on the petiole, wedge-shaped at base. Flowers in compound corymbs. Calyx $\frac{3}{4}$ in. long; teeth triangular-lanceolate. Corolla pink, funnel-shaped, 2 in. long. Capsule $\frac{3}{4}$ in. long. Flowers in February and March.

An occasional weed of waste places. It is not cultivated near Madras.

Nicotiana plumbaginifolia, Viv.

Pl. XXIII, C.

An erect annual herb up to 2 ft. in height. All parts covered with sticky glandular hairs. Leaves forming a rosette at the base; the upper leaves lanceolate, stem-clasping, irregularly toothed, more or less acute, up to $4\frac{1}{2}$ in. long; those forming the tuft elliptic-oblong or elliptic-lanceolate, almost entire at the margin, obtuse at apex, reaching up to

10 in. long. Flowers arranged in distant racemes at ends of branches. Calyx about $\frac{1}{2}$ in. long, 10-ribbed; teeth triangular-lanceolate, acuminate. Corolla narrow, with a long tube, linear, light pink, about $1\frac{1}{2}$ in. long. Capsule ovoid, $\frac{1}{3}$ in. long. Flowers August to April.

Roadsides in Egmore (Hall's Road). A native of Mexico and the West Indies. It has become thoroughly established in the city.

Solanum, Linn.

Herbs or shrubs armed with prickles or not. Calyx enlarging with fruit or not. Corolla wheel-shaped; tube short; limb pleated, usually 5-lobed. Anthers converging around the style, opening at the tips by two pores or chinks. Berry 2-celled.

- | | | | | | |
|---|--|-----|-----|-------------------|--------------------------------|
| 1 | Plants not armed with prickles or thorns | ... | ... | ... | 2 |
| | Plants armed with prickles or thorns | ... | ... | ... | 3 |
| 2 | An erect annual herb; flowers white; leaves entire | ... | ... | nigrum. | |
| | A herb climbing by means of the petioles; flowers blue; | | | | |
| | leaves pinnately cut | ... | ... | ... | seaforthianum
(cultivated). |
| 3 | Leaves divided into few lobes and cut to a depth not exceed- | | | | |
| | ing $\frac{1}{3}$ of diameter | ... | ... | ... | 4 |
| | Leaves divided into many lobes and cut to a depth exceeding | | | | |
| | $\frac{1}{3}$ of diameter | ... | ... | ... | 6 |
| 4 | Flowers white | ... | ... | ... | torvum. |
| | Flower blue | ... | ... | ... | 5 |
| 5 | Racemes few-flowered; calyx enlarging in fruit; fruit large. | | | Melongena (culti- | |
| | | | | vated). | |
| | Racemes many-flowered; calyx not enlarging in fruit; fruit | | | | |
| | small | ... | ... | ... | indicum. |
| 6 | A climbing, shrubby herb | ... | ... | ... | trilobatum. |
| | A loosely spreading, perennial herb | ... | ... | ... | xanthocarpum. |

Solanum nigrum, Linn.

மணத்தக்காளி

காமுంచి, காவி

Leaves numerous, ovate-lanceolate, glabrous, thin, narrowing to the leaf-stalk, up to 3 in. long. Flowers small, arranged in umbel-like cymes. Calyx not enlarging in fruit. Corolla divided into 5 lobes. Berry purplish-black, sometimes red or yellow, $\frac{1}{4}$ in. in diameter. Appearing after the rains have set in.

A very common weed of roadsides and cultivated land. The leaves and fruit are eaten in curries.

Solanum seaforthianum, Andr. Potato Creeper

A climber with pinnately cut leaves. The petioles serve the purpose of tendrils. It is cultivated in gardens and occasionally may be found as an escape. A native of Tropical America.

Solanum torvum, Swartz

சுண்டைக்காய்

கூழைக்காய்

A shrub reaching up to 12 ft. Prickles very few, on stem and leaf-stalk only. Leaves and younger parts of stem covered with short soft hairs. Leaves ovate with or without a few large triangular lobes, up to 9 in. long. Cymes corymbose, many-flowered. Corolla white, finely hairy on the outside, $\frac{3}{4}$ in. across. Berry yellow when ripe, about $\frac{1}{3}$ in. in diameter. Flowers August to December.

Occasionally met with in waste places and sometimes cultivated for the berries which are eaten as a vegetable.

Solanum Melongena, Linn. The Egg-Plant or Brinjal

கத்தரிச்செடி

வங்காய்

Widely cultivated for its fruit which is a well-known vegetable. Its native country is not known with certainty. It is not known to be truly wild anywhere but it is very frequently found as an escape.

Solanum indicum, Linn.

முள்ளி

A branching prickly shrubby herb. Ends of branches hairy. Leaves ovate, usually with a few large triangular lobes, sparsely prickly and finely hairy on both surfaces. Flowers in raceme-like cymes. Corolla pale purple, hairy outside, $\frac{5}{8}$ in. across. Filaments very short. Berry dark yellow when ripe, about $\frac{1}{3}$ in. in diameter. Flowers October to December.

Guindy Park. The fruit is cooked in curries.

Solanum trilobatum, Linn.

தூதுளி

Pl. XXIII, D.

ముండ్లము

A shrubby herb climbing by means of numerous hooked thorns. Leaves ovate, 3- to 5-lobed or wavy, with or without a few prickles on the midrib, glabrous, up to 3 in. long. Flowers showy, in cymes of 2-8 flowers. Corolla purple, exceeding $\frac{1}{2}$ in. across. Berry scarlet when ripe, $\frac{1}{3}$ in. in diameter. Flowers chiefly from October to January.

Common in hedges almost everywhere. The roots are used in Indian medicine.

Solanum xanthocarpum, Shrad.

கண்டங்கத்தரி

A spreading very prickly herb with numerous branches. Stem, leaves and calyces covered with numerous straight, yellow spines exceeding $\frac{1}{2}$ in. in length. Leaves pinnately

cut half-way across, ovate or elliptic in outline, up to 4 in. long. Flowers in few-flowered cymes. Corolla purple-blue, $\frac{3}{4}$ in. across. Berry yellow with green blotches, $\frac{3}{4}$ in. in diameter. Flowers mostly from October to March.

Very common in dry open situations. The root is much used in Indian medicine.

Lycopersicum, Mill.

Tall herbs. Leaves pinnate. Pinnae toothed or cut into deep lobes. Flowers in few-flowered cymes. Sepals 5 or 6, unaltered in fruit. Corolla wheel-shaped, yellow. Anthers connivent in a long cone.

Lycopersicum esculentum, Mill. The Tomato

சீமைத் தக்காளி

A native of Tropical America frequently cultivated in gardens for its fruit. Occasionally found as an escape.

Capsicum, Linn. Chili

Annual or perennial herbs. Flowers 3 together. Calyx small. Corolla wheel-shaped; lobes 5, valvate in bud. Anthers shorter than the filaments. Berry many-seeded.

Flowers standing singly	...	...	...	...	...	...	frutescens.
Flowers 2 or 3 together	...	...	...	...	...	...	minimum.

Capsicum frutescens, Linn. The Common Chili

மிளகாய் மிளகாய்

Capsicum minimum, Roxb. The Bird's-eye Chili

ஊசி மிளகாய் சூடி மிளகாய்

A perennial shrub with smaller fruit than the common kind.

Both are cultivated and found as escapes near villages.

Physalis, Linn.

Annual herbs. Flowers standing singly in the axils of leaves. Calyx cleft, gradually enlarging and when ripe becoming much inflated and loosely enclosing the 2-celled globular, edible berry.

Physalis minima, Linn.

தக்காளி Pl. XXIII, E. பாடாபாடா

Stem erect and spreading, about 1 foot high. Leaves thin, ovate, acute, shallowly toothed, base wedge-shaped, minutely hairy, up to 2 in. long. Corolla yellow. Berry $\frac{1}{3}$ in. in diameter, entirely enveloped by the enlarged thin calyx. Flowers September to December.

A common weed in waste places and on the borders of cultivated land.

Scrophulariaceae

Herbs. Leaves opposite or occasionally whorled; the upper ones sometimes alternate. Corolla generally 2-lipped, the lobes unequal or sometimes nearly equal, usually 5, rarely 4, imbricate. Stamens 4, sometimes only 2 developed and the other 2 sterile. Ovary 2-celled. Ovules many. Fruit a capsule.

- | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-------------|
| 1 | Stamens 4 perfect | ... | ... | ... | ... | ... | 2 |
| | Stamens 2 perfect and 2 undeveloped | ... | ... | ... | ... | ... | 8 |
| 2 | Corolla with nearly equal lobes | ... | ... | ... | ... | ... | 3 |
| | Corolla with unequal lobes | ... | ... | ... | ... | ... | 4 |
| 3 | Corolla with a cylindrical tube, 5-lobed, throat not hairy | ... | ... | ... | ... | ... | Moniera. |
| | Corolla flat, 4-lobed, throat hairy | ... | ... | ... | ... | ... | Scoparia. |
| 4 | Corolla-tube curved inwards abruptly | ... | ... | ... | ... | ... | Striga. |
| | Corolla-tube not curved inwards abruptly | ... | ... | ... | ... | ... | 5 |
| 5 | Leaves aromatic | ... | ... | ... | ... | ... | 6 |
| | Leaves not aromatic | ... | ... | ... | ... | ... | 7 |
| 6 | Herbs covered with sticky hairs | ... | ... | ... | ... | ... | Stemodia. |
| | Herbs not covered with sticky hairs | ... | ... | ... | ... | ... | Limnophila. |
| 7 | Leaves pinnately cut | ... | ... | ... | ... | ... | Sopubia. |
| | Leaves not pinnately cut | ... | ... | ... | ... | ... | Vandellia. |
| 8 | Leaves few; upper ones minute | ... | ... | ... | ... | ... | Dopatrium. |
| | Leaves many; upper ones not minute; nerves often 1-5 starting from the base | ... | ... | ... | ... | ... | Ilysanthes. |

Moniera, B. Juss. (Herpestis, Gaertn.)

Glabrous herbs. Flowers 1 or more in the axils of leaves. Calyx with 5 imbricate lobes, the upper lobe largest. Corolla 2-lipped; tube cylindrical. Capsule 2-grooved.

A creeping herb; leaves obovate-oblong; flowers standing singly cuneifolia.

An erect herb; leaves linear-lanceolate; flowers 1-3 together floribunda.

Moniera cuneifolia, Michx. (Herpestis Monnieria, H.B. & K.)

தீர்ப்பிரமி Pl. XXIV, C. சாகு வாழைச்செடி

A creeping herb rooting at the nodes. Branches numerous, becoming erect. Leaves not stalked, somewhat fleshy, obovate-oblong or gradually narrowing from a rounded end, nerves obscure, $\frac{1}{4}$ -1 in. long. Flowers on slender stalks, standing singly in the axils of leaves. Corolla pale blue; lobes nearly equal. Fruit small. Flowers November to February.

Very common in wet places such as the borders of tanks or rice fields. The leaves are used in medicine.

Moniera floribunda, T. Cooke (Herpestis floribunda, R. Br.)

An erect slender glabrous herb. Leaves linear or linear-lanceolate, $\frac{1}{2}$ -1 $\frac{1}{4}$ in. long. Flowers 2 together in each axil. Corolla white with purplish stripes on the upper lip. Capsules small. Flowers after the rains. Fruit ripens in March.

Vandalur Tank.

Scoparia, Linn.

Herbs with somewhat woody branches. Leaves opposite or whorled. Flowers small, 1 or 2 standing in the axils of leaves. Corolla flat, 4-lobed, the throat densely hairy, lobes nearly equal. Stamens 4, nearly equal. Fruit a small ovoid capsule enclosed in the calyx.

Scoparia dulcis, Linn.

Pl. XXIV, B.

A small branched annual herb 1-3 ft. high. Leaves opposite or 3 at a node, elliptic-lanceolate, coarsely serrate, $\frac{3}{4}$ -1 $\frac{1}{2}$ in. long. Sepals 4. Flowers small, white. Fruit $\frac{1}{6}$ in. long. Flowers at all seasons but the driest.

A common weed of waste places. It is a native of Tropical America that has become thoroughly established in Madras.

Striga, Lour.

Herbs. Leaves linear, the lower ones opposite and the upper ones alternate. Calyx tubular, 4-, 5-, 10- or 15-ribbed, 5-toothed. Corolla 2-lipped; tube abruptly curved inwards at or above the middle. Stamens 2 short and 2 long. Capsule roundish.

- | | | | | | | | |
|---|--|-----|-----|-----|-----|----------------|-------------|
| 1 | Calyx 5-ribbed | ... | ... | ... | ... | ... | densiflora. |
| | Calyx 10- or 15-ribbed | ... | ... | ... | ... | ... | 2 |
| 2 | Calyx 10-ribbed, the secondary ribs ending at the angles between adjacent calyx-teeth | ... | ... | ... | ... | ... | lutea. |
| | Calyx 15-ribbed, the secondary ribs not ending at the angles between adjacent calyx-teeth but continuing up to tip | ... | ... | ... | ... | ... | 3 |
| 3 | Corolla small, white; limb $\frac{1}{2}$ in. in diameter | ... | ... | ... | ... | euphrasioides. | |
| | Corolla large, yellow; limb $\frac{3}{4}$ in. in diameter | ... | ... | ... | ... | Masuria. | |

Striga densiflora, Benth.

An erect herb covered with stiff hairs. Leaves linear, passing into floral bracts, up to $1\frac{1}{2}$ in. long. Flowers in slender spikes in the axils of bracts. Calyx 5-ribbed, $\frac{1}{4}$ in. long. Corolla white; tube $\frac{1}{3}$ in. long; limb $\frac{1}{4}$ in. across. Flowers in December.

Ennur. In grassy places in the tank at Velacherry it occurs in striking profusion.

Striga lutea, Lour.

An erect rigid slender herb covered with sharp, stiff hairs. Leaves linear, rough due to the presence of small prickles, $1-1\frac{1}{4}$ in. long. Flowers in slender spikes. Bracts longer than the calyx. Calyx narrowly tubular in flower, widening in fruit, with one strong roughly-hairy rib running from the base of the calyx to the apex of each tooth and with an additional rib between them which ends at the angle between two adjacent calyx-teeth. Corolla white or yellow, $\frac{1}{8}$ in. across (in well-grown specimens up to $\frac{1}{4}$ in.). Lower lip longer than the upper, 3-lobed. Capsules $1\frac{1}{5}$ in. long. Seeds minute. Flowers in November and December.

Vandalur (white-flowered variety). Guindy Park (yellow-flowered variety).

Striga euphrasioides, Benth.

A slender erect unbranched herb. Leaves linear, not stalked, covered with rough hairs. Flowers in distant spikes, carried on minute stalks. Calyx 15-ribbed, bell-shaped, $\frac{1}{3}$ in. long. Corolla white, over $\frac{1}{2}$ in. long. Capsule oblong-ellipsoid, $\frac{1}{4}$ in. long. Flowers September to November.

In grassy places.

Striga Masuria, Benth.

A slender erect herb covered with rough hairs. Leaves linear, 1-2 in. long. Flowers in distant racemes. Calyx 15-ribbed, $\frac{2}{3}-1$ in. long in fruit; ribs prominent; lobes covered with glands and soft hairs. Corolla yellow; tube $\frac{3}{4}$ in. long; limb 1 in. across. Flowers after the rains. Fruit ripens in April.

Thiruvannamiyur, near Adyar.

Stemodia, Linn.

Aromatic herbs. Flowers standing singly in the axils of leaves and passing into close racemes at the ends of branches. Corolla 2-lobed. Stamens 4, 2 short and 2 long. Fruit an ovoid capsule.

Stemodia viscosa, Roxb.

A many-branched sweet-smelling herb covered with sticky hairs. Leaves clasping the stems by their bases, not stalked, oblong, slightly serrate, $\frac{1}{2}-1\frac{1}{2}$ in. long. Corolla violet, $\frac{1}{3}$ in. long. Flowers in February and March.

Very common in rice fields and dried up ponds.

Limnophila, R. Br.

Marsh-or water-plants. Leaves with transparent spots, opposite or whorled, aromatic, the submerged ones very much divided. Upper lip of corolla entire or 2-lobed; lower lip 3-lobed. Stamens 4. Fruit an ovoid or globose capsule.

Limnophila gratioloides, R. Br.

A small plant smelling of turpentine. Stems slender, rooting at the lower nodes. Middle leaves whorled, upper ones opposite, linear-oblong, toothed, up to $\frac{3}{4}$ in. long. Flowers standing singly in the axils. Corolla white with a pink ring at the mouth, $\frac{1}{3}$ in. long. Fruit small. Flowers in January and February.

Tank margins at Ennur. Swampy places in Guindy Park.

Sopubia, Ham.

Erect herbs. Leaves opposite, narrow, pinnately divided or cut into 3 segments. Flowers in spikes or racemes, with leafy bracts, sometimes standing singly. Calyx cup-shaped, 5-toothed. Corolla-tube funnel-shaped, dilated at the throat; lobes 5, spreading. Stamens 4. One cell of each anther fertile, the other undeveloped.

Sopubia delphinifolia, G. Don.

Pl. XXIV, E.

A much-branched erect herb. Leaves opposite, pinnately cut into thin segments, $1-1\frac{1}{2}$ in. long, the uppermost passing into long floral leaves. Flowers in few-flowered racemes at the ends of branches or standing singly in the axils of leaves. Calyx glabrous, $\frac{3}{4}$ in. long. Corolla rose-coloured, $1-1\frac{1}{2}$ in. long. Filaments hairy. Capsule ellipsoid-oblong, $\frac{1}{4}$ in. long. Flowers in January.

In wet places in Guindy Park.

Vandellia Linn.

Small herbs. Flowers small. Corolla 2-lipped; tube cylindrical. Stamens 4, 2 upper and 2 lower, the latter having curved filaments. Anthers cohering in pairs.

Vandellia crustacea, Benth.

Pl. XXIV, D.

A spreading annual herb much-branched from the base. Leaves ovate, toothed, up to $\frac{3}{4}$ in. long. Flowers standing singly in the axils of leaves or in small racemes at the ends of branches, carried on stalks $\frac{1}{2}-1\frac{1}{2}$ in. long. Corolla purplish, about $\frac{1}{3}$ in. long. Capsule ellipsoid-oblong. Flowers October to December.

Very common in wet places.

Dopatrium, Buch.-Ham.

Slender glabrous marsh-herbs. Leaves few, opposite, the lower pairs small, the upper ones minute and remote from each other. Flowers small, standing singly in the axils of leaves. Corolla violet, 2-lipped. Stamens 4, the upper 2 perfect, the lower 2 undeveloped.

Fruit linear- oblong, carried on downward-turned stalks;

stems 3-4 in. high nudicaule.

Fruit rounded, carried on erect stalks; stems 6-12 in. high ... junceum.

Dopatrium nudicaule, Buch.-Ham.

Stem slender, branched from the base, sometimes single. The few leaves forming a tuft at the base of the stem oblong-obovate, $\frac{1}{3}$ in. long; those on the stem minute. Corolla $\frac{1}{3}$ in. long. Capsule $\frac{1}{3}$ in. long, their stalks bent downwards. Flowers December to February.

Occasionally found in damp places. On the sides of the Buckingham Canal near Covelong.

Dopatrium junceum, Buch.-Ham.

A somewhat fleshy herb 6-12 in. in height. Leaves few, not stalked, the lower ones obovate, the upper ones much smaller and standing widely apart. Flowers carried on short stalks up to $\frac{1}{2}$ in. long. Corolla pinkish-violet, up to $\frac{1}{5}$ in. long. Capsule roundish, 1-celled, with ovules attached to the walls of the ovary. Flowers September to February.

Ennur, in swampy places such as the edge of the pond opposite the Railway Station. Red Hills.

Dopatrium lobelioides, Benth.

A larger plant with larger leaves and flowers is mentioned by Gamble as occurring near Madras. I have not come across this species.

Ilysanthes, Rafin.

Glabrous herbs usually found in swampy places. Leaves ribbed from the base or not. Stamens 4, the upper 2 perfect, the lower 2 remaining undeveloped. Ovary with many ovules.

1 Leaves with 1-5 ribs from the base; flowers white or yellow 2

Leaves with a main median rib that gives off branches; flowers blue or violet 3

- | | | | | | | |
|---|--|-----|-----|-----|-----|-----------------|
| 2 | Plant 4-6 in. high; flowers white | ... | ... | ... | ... | parviflora. |
| | Plant under 3 in. high; flowers yellow | ... | ... | ... | ... | minima. |
| 3 | Stems rooting at the nodes; flowers violet | ... | ... | ... | ... | veronicaefolia. |
| | Stems short, erect; flowers blue | ... | ... | ... | ... | oppositifolia. |

Ilysanthes parviflora, Benth.

An erect branching herb. Leaves oblong-lanceolate, entire, main nerves 3-5. Flowers in short racemes in the axils of leaves or at the ends of branches. Corolla white, $\frac{1}{4}$ in. long. Capsule ovoid-oblong, pointed at apex. Seeds minute. Flowers October to February.

Common in moist places.

Ilysanthes minima, Benth.

Minute herbs under 3 in. high. Stems usually single, sometimes branched. Leaves minute, of few pairs, the lowest pair oblong, the upper ones lanceolate, up to $\frac{1}{5}$ in. long. Flowers standing singly in the axils of leaves on very slender stalks $\frac{1}{3}$ in. long. Corolla yellow. Capsule somewhat rounded. Flowers January to March.

In wet places at Red Hills. In the specimens examined by me the flowers were smaller than those of the type.

Ilysanthes veronicaefolia, Urban. (*Bonnaya veronicaefolia*, Spreng.)

Stems creeping and rooting at the nodes. Leaves oblong, serrate, gradually narrowing into a very small stalk, $\frac{1}{2}$ - $1\frac{1}{4}$ in. long. Flowers in racemes in the axils of leaves or at the ends of branches, violet streaked with darker violet lines, $\frac{3}{8}$ in. long. Flowers September to January.

In moist places. The Guindy form has much broader leaves.

Ilysanthes oppositifolia, Urban, (*Bonnaya oppositifolia*, Spreng.)

A small erect branched annual. Leaves not stalked, linear-oblong, slightly serrate, $\frac{3}{4}$ - $1\frac{1}{4}$ in. long. Flowers standing singly in the axils of leaves or in racemes at the ends of branches. Corolla blue, $\frac{1}{4}$ in. long. Capsule $\frac{1}{3}$ in. long. Flowers December to February.

In wet places in Madras. On the edge of the tank at Vandalur.

Lentibulariaceae

Small herbs growing in water or wet places, often furnished with bladder-like appendages. Leaves, when submerged, much dissected. Flowers on a leafless axis. Calyx 2-lipped. Corolla 2-lipped, the lower lip much the larger, 3-lobed, produced backwards into a spur. Stamens 2. Ovary superior, 1-celled. Ovules many. Fruit a capsule.

Utricularia, Linn. The Bladderworts

Leaves usually having bladders, dissected into filament-like segments in floating species, entire in those growing in wet places. Flowers in few-flowered racemes. Stigma unequally 2-lobed.

Utricularia flexuosa, Vahl

Pl. XXV, A.

A much-branched herb floating in large masses. Leaves usually in whorls of 4, divided into numerous filament-like segments, carrying globose bladders. Racemes 3- to 8-flowered. Flower-stalks $\frac{1}{4}$ - $\frac{3}{4}$ in. long, at first straight, afterwards pointing downwards. Corolla yellow, $\frac{1}{3}$ - $\frac{1}{2}$ in. across. Capsule globose, beaked with the thick persistent style, $\frac{1}{6}$ in. in diameter. Flowers after the rains.

This species was very common in tanks in Madras but it is now becoming scarce.

Bignoniaceae

Trees or shrubs. Leaves opposite, pinnately compound. Flowers large and showy. Calyx 2- to 5-lobed. Corolla 2-lipped; lobes 5, nearly equal, imbricate in bud. Stamens 4, 2 of them longer than the others, often with a fifth imperfect one. Cells of anthers parallel or diverging. Ovary 2-celled. Ovules numerous. Fruit usually a long capsule splitting along the two partition walls. Seeds usually prominently winged.

Millingtonia, Linn.

Tall trees with corky bark. Leaves opposite, bi- or tri-pinnately compound. Flowers in corymb-like panicles at the ends of branches. Calyx small, truncate, or with 5 short teeth. Corolla white, with a long slender tube; limb obscurely 2-lipped; lobes 5, nearly equal. Stamens 4. Anthers 1-celled, the second cell undeveloped. Fruit an elongate, linear capsule. Seeds flattened, with a broad wing.

Millingtonia hortensis, Linn. The Indian Cork Tree

மரமல்லிகை

Pl. XXV, E.

మానుకంపం

A tall handsome tree. Bark corky. Leaflets ovate-lanceolate, dark green, glabrous, 2-3 in. long. Flowers in panicles at the ends of branches. Corolla with a long tube, fragrant, soon falling, about $2\frac{1}{2}$ in. long. Fruit a strap-shaped capsule, over 1 foot long. Seeds with a thin papery wing all round. Flowers during the rains and after.

A native of Burma. It is frequently planted in avenues and gardens and has become more or less naturalized, seedlings springing up freely in favourable situations.

Martynia, Linn.

Erect annuals with thickish stems. Flowers large, arranged in racemes. Calyx 5-cleft; lobes mostly unequal. Corolla bell-shaped, 5-lobed, indistinctly 2-lipped. Fertile stamens 2. Flesh of drupe falling away and leaving a hard woody inner part terminated by a 2-horned beak. Seeds several.

Martynia annua, Linn. (*Martynia diandra*, Glox.) The Tiger-claw Plant

தேள்கொடுக்குக்காய்

Pl. XXV, D.

தேள்கொடுக்காய்

A large annual herb. Leaves large, deltoid-ovate, cordate at base, unevenly lobed, minutely toothed, covered with sticky hairs. Flowers large, handsome. Corolla light pink, blotched with yellow on the inside and purple outside. Stamens 2. Fruit hard, woody, with a pair of sharp recurved claws. Flowers in the rainy weather.

Occasional on roadsides, rubbish heaps and in waste places. A native of Mexico escaped from gardens.

Pedaliium, Linn.

Erect annual herbs. Flowers yellow. Fruit hard. Upper portion pyramidal-ovoid, obtuse, obscurely 4-angled, each angle armed with a sharp horizontal conical spine.

Pedaliium murex, Linn.

யானைதெரிஞ்சில்

Pl. XXV, C.

யானைதெரிஞ்சில்

Stem about 1 foot in height. Leaves somewhat fleshy, broadly ovate-oblong, with about 5 blunt teeth on either side, about $1\frac{1}{4}$ in. long. Leaf-stalk about $1\frac{1}{2}$ in. long. Corolla bright yellow, 1 in. long, $\frac{3}{4}$ in. across, 5-lobed; lobes nearly equal. Fruit narrowed at the base, pyramidal-ovoid above, armed with 4 spines. Flowers September to January.

A common weed in waste places. Water in which the leaves are soaked gets thick and mucilaginous and is administered as a medicine.

Sesamum, Linn.

Erect or prostrate herbs. Leaves opposite below, alternate above. Corolla 2-lipped, the upper lip smaller than the lower one. Ovary 2-celled, appearing to be 4-celled. Ovules numerous, arranged like a pile of coins in each chamber. Capsule oblong-ovoid, 4-angled, 4-grooved.

A prostrate herb prostratum.

An erect herb indicum (cultivated).

Sesamum prostratum, Retz.

Pl. XXV, B.

Stems many spreading on the ground. Leaves lying flat on the ground, facing upwards, obovate, coarsely toothed, densely covered with soft white hairs beneath, $\frac{3}{4}$ in.

long. Flowers purple, lying flat on the ground, up to 1 in. long. Capsule ovoid, over $\frac{1}{2}$ in. long. Flowers September to November.

On sand dunes near the sea.

Sesamum indicum, Linn. The Gingelly Oil Plant

எள்ளுரு கருவேல

An erect annual herb up to 2 ft. high. Leaves lanceolate. Flowers white or pinkish. Fruit bluntly quadrangular, shortly beaked. Seeds numerous. Cultivated as a field crop and often found run wild. Its native country is not known with certainty but is probably Africa.

Acanthaceae

Chiefly herbs, sometimes shrubs. Leaves opposite, simple. Flowers usually with a number of bracts. Corolla 2-lipped or somewhat unequally 5-lobed; lobes convolute or imbricate in bud. Stamens 4 or 2. Fruit a 2-celled and few-seeded capsule, usually flattened contrary to the valves and partition. Seeds usually flat and supported by hooked projections of the placenta except in *Thunbergia* and *Elytraria*.

- | | | |
|---|--|---------------------------------|
| 1 | Seeds not supported by hooked projections on the placenta | 2 |
| | Seeds supported by hooked projections on the placenta ... | 3 |
| 2 | Climbers; flowers large | <i>Thunbergia</i> , p. 215. |
| | Erect plants; flowers small | <i>Elytraria</i> , p. 216. |
| 3 | Corolla without an upper lip | 4 |
| | Corolla 2-lipped or somewhat unequally 5-lobed | 5 |
| 4 | Leaves spiny; spines also present at the base of petioles ... | <i>Acanthus</i> , p. 216. |
| | Leaves not spiny (in Madras genera); spines not present
at the base of petiole | <i>Blepharis</i> , p. 216. |
| 5 | Corolla-lobes twisted to the left in bud | 6 |
| | Corolla-lobes imbricate in bud | 10 |
| 6 | Ovules 2 in each cell | <i>Dysochoriste</i> , p. 217. |
| | Ovules more than 2 in each cell | 7 |
| 7 | Corolla distinctly 2-lipped | 8 |
| | Corolla 5-lobed, the lobes slightly unequal | 9 |
| 8 | Inflorescence spiny; capsules 2- to 8-seeded | <i>Asteracantha</i> , p. 217. |
| | Inflorescence not spiny; capsules with 8 or more seeds ... | <i>Hygrophila</i> , p. 218. |
| 9 | Capsules not having seeds at the base | <i>Ruellia</i> , p. 218. |
| | Capsules having seeds at the base | <i>Stenosiphonium</i> , p. 219. |

- | | | | | | | | | |
|----|--|-----|-----|-----|-----|-----|-----|-----------------------|
| 10 | Ovules 3-10 in each cell | ... | ... | ... | ... | ... | ... | Andrographis, p. 219. |
| | Ovules 2 in each cell | ... | ... | ... | ... | ... | ... | 11 |
| 11 | Corolla with 5 slightly unequal lobes | ... | ... | ... | ... | ... | ... | 12 |
| | Corolla distinctly 2-lipped | ... | ... | ... | ... | ... | ... | 13 |
| 12 | Calyx divided into 4 lobes; only 2 stamens fully developed | ... | ... | ... | ... | ... | ... | Barleria, p. 220. |
| | Calyx divided into 5 lobes; stamens 4, all fully developed | ... | ... | ... | ... | ... | ... | Asystasia, p. 220. |
| 13 | Stamens 4; bracts conspicuous | ... | ... | ... | ... | ... | ... | Lepidagathis, p. 221. |
| | Stamens 2 | ... | ... | ... | ... | ... | ... | 14 |
| 14 | Placentae separating elastically from the valves from the base | ... | ... | ... | ... | ... | ... | Rungia, p. 221. |
| | Placentae not separating elastically from the valves | ... | ... | ... | ... | ... | ... | 15 |
| 15 | Anther-cells parallel; bracts large, imbricate | ... | ... | ... | ... | ... | ... | Ecboium, p. 222. |
| | Anther-cells one higher up than the other | ... | ... | ... | ... | ... | ... | 16 |
| 16 | Anther-cells with a white, basal, spur-like appendage | ... | ... | ... | ... | ... | ... | Justicia, p. 222. |
| | Anther-cells without spur-like appendage at the base | ... | ... | ... | ... | ... | ... | 17 |
| 17 | Anther-cells with a minute sharp point at the base; bracts large | ... | ... | ... | ... | ... | ... | Adhatoda, p. 224. |
| | Anther-cells without a minute sharp point at the base | ... | ... | ... | ... | ... | ... | 18 |
| 18 | Corolla white | ... | ... | ... | ... | ... | ... | Rhinacanthus, p. 224. |
| | Corolla pink or purple | ... | ... | ... | ... | ... | ... | Peristrophe, p. 224. |

Thunbergia, Linn.

Climbers. Flowers large. Bracts and bracteoles large, the latter enclosing the flower buds. Corolla-tube swollen, curved; sides of limb unequal, with rounded lobes, twisted to the left in bud. Stamens 4, 2 of them longer than the others. Ovary 2-celled. Ovules 2 in each cell. Capsule roundish below, suddenly narrowed to a barren, sword-shaped beak.

Thunbergia fragrans, Roxb.

A twining slender herb. Leaves triangular-ovate, with a pair of angular lobes at the base, slightly drawn out at apex, 2-3½ in. long. Flowers standing singly in the axils of leaves. Calyx with 12-15 teeth. Corolla pure white, not fragrant, 1½ in. long. Capsule 1 in. long including the beak. Flowers in February.

Very occasionally met with on road sides. Probably a garden escape.

Thunbergia grandiflora, Roxb.

A large climber with large ovate or angular leaves and light blue or white flowers. A Native of Eastern Bengal cultivated in gardens.

Elytraria, Vahl.

Herbs, almost stemless. Leaves crowded, arising all from the base of the much-reduced stem. Flowers small, arranged in spikes. Calyx 4-partite. Corolla-tube linear; limb 2-lipped; lobes 5, imbricate in bud. Stamens 2 perfect. Ovules 6-10 in each cell, arranged one over the other.

Elytraria acaulis, Lindau (*Elytraria crenata*, Vahl)

Leaves obovate-oblong, crenate, 4-8 in. long. Spikes several, simple or branched, having bracts. Calyx divided to the base and having scaly margins. Corolla white, up to $\frac{1}{3}$ in. long. Capsule ovoid, $\frac{1}{5}$ in. long. Flowers October to March.

On the embankment and in the scrub jungle bordering on the Red Hills Tank.

Acanthus, Linn.

Shrubs or herbs. Leaves pinnately cut, toothed, spinous. Flowers in spikes. Calyx 4-partite. Corolla-tube short, upper lip much reduced, lower elongate. Stamens 4, 2 longer than others. Anthers 1-celled. Ovules 2 in each cell.

Acanthus ilicifolius, Linn.

கழுதை முள்ளி மலி

A stiff shrub up to 5 ft. high. Leaves oblong, pinnately toothed, with sharp spinous teeth on the margins, nerves prominent, 3-6 in. long. Flowers in spikes at the ends of branches. Calyx about $\frac{5}{8}$ in. long. Corolla blue, $1\frac{3}{4}$ in. long. Capsule oblong, shiny, 1 in. long. Flowers November to June.

On the banks of the Adyar near the sea.

Blepharis, Juss.

Herbs, often somewhat spiny. Leaves opposite or sometimes 4 in a whorl. Flowers standing singly or 2 or 3 together. Bracts in 3 or 4 pairs. Calyx 4-partite. Upper lip of corolla very slightly developed, the lower lip spreading, flat, with 3-5 rounded lobes. Stamens 4, 2 of them longer than the others. Only 1 cell of each anther developed. Ovules 2 in each cell of the ovary.

Leaves stalked, distinctly toothed, up to $2\frac{1}{2}$ in. long; outer lobe of calyx 1 in. long; corolla-lip up to $\frac{2}{3}$ in. long ... *boerhaaviaefolia*.

Leaves almost stalkless, entire, with long scattered hairs, up to 1 in. long; outer lobe of calyx up to $\frac{1}{3}$ in. long; corolla-lip about $\frac{1}{3}$ in. long ... *molluginifolia*.

Blepharis boerhaaviaefolia, Pers.

A prostrate plant with wiry stems rooting at the nodes. Leaves in whorls of 4, unequal, elliptic or slightly obovate, almost entire, $1-2\frac{1}{2}$ in. long. Flowers standing singly or

2-4 together. Bracteols of 4 pairs, white with green veins, furnished with hairy bristles on the margins. Calyx-segments up to $\frac{1}{2}$ in. long. Corolla pale blue with a yellow spot on the lower lip, up to $\frac{2}{3}$ in. long. Capsules ovoid, $\frac{1}{3}$ in. long. Seeds 2. Flowers in March and April.

Hills near Pallavaram.

Blepharis molluginifolia, Pers.

Stems prostrate, wiry, covered with rough hairs. Leaves in whorls of 4, unequal, thick, narrowly oblong, with a sharp point at apex, up to 1 in. long. Flowers standing singly in the axils of leaves. Bracts of 5 pairs, tipped with bristles on the margins. Calyx up to $\frac{3}{8}$ in. long. Corolla blue, $\frac{3}{8}$ in. long. Capsule ellipsoid, enclosed within the sepals, $\frac{1}{4}$ in. long. Seeds 2. Flowers November to February.

In dry places.

Dysochoriste, Nees (*Calophanes*, D. Don.)

Herbs or shrubby herbs. Flowers in clusters or cymes in the axils of leaves. Mouth of corolla obscurely 2-lipped; lobes twisted in bud. Stamens 4. Ovules 2 in each cell.

Dysochoriste littoralis, Nees (*Calophanes littoralis*, T. And.)

A shrubby herb. Leaves small, obovate, $\frac{1}{2}$ in. long. Flowers standing singly in the axils of leaves. Corolla bluish-purple, narrowly cylindrical below, upper part funnel-shaped, $\frac{3}{4}$ in. long. Capsule $\frac{1}{3}$ in. long.

This species is included on the authority of Mr. Fischer.

Asteracantha, Nees (*Hygrophila*, R. Br., in part)

Stout herbs with long sharp thorns near the leaves. Leaves in whorls of 6. Flowers arranged in whorls in the axils of leaves, surrounded by spines and leafy bracts. Calyx deeply divided into 4 parts, the upper lobe the largest. Corolla 2-lipped, the upper lip 2-lobed, the lower 3-lobed with 2 crest-like folds inside. Stamens 4, two of them longer. Ovules 4 in each cell. Fruit a linear-oblong capsule.

Asteracantha longifolia, Nees (*Hygrophila spinosa*, T. And.)

தீர் முள்ளி Pl. XXVI, A. நீயுளம்பி

A tall hairy herb thickened at the nodes. Leaves oblong-lanceolate, the outer two of the whorl large, up to 7 in. long; the 4 inner ones about $1\frac{1}{2}$ in. long. A yellowish, sharp spine $1-1\frac{3}{4}$ in. long present in the axil of each leaf. Corolla purple-blue, up to $1\frac{1}{4}$ in. long; tube abruptly swollen at the top. Capsule $\frac{1}{3}$ in. long. Flowers in the rainy weather.

Very common in rice fields and swampy places. The plant is used in medicine.

Hygrophila, R. Br.

Herbs found in wet places. Flowers bluish-purple. Calyx 5-toothed. Corolla 2-lipped; lobes twisted in bud. Stamens 4, 2 of them longer. Seeds numerous.

Hygrophila angustifolia, R. Br. (*Hygrophila salicifolia*, Nees)

Pl. XXVI, B.

An erect herb rooting at the lower nodes. Stems more or less, quadrangular. Leaves entire, lanceolate, glabrous, $\frac{3}{4}$ -3 in. long. Flowers in whorls in the axils of leaves, very showy. Corolla light bluish-purple, $\frac{1}{2}$ - $\frac{2}{3}$ in. long. Capsules $\frac{1}{2}$ - $\frac{2}{3}$ in. long. Flowers in February and March.

In swampy places and rice fields.

Ruellia, Linn.

உபாஸ்காய் చిటపటకాయ

Herbs. Flowers standing singly or in clusters. Calyx 5-parted. Corolla funnel-shaped, somewhat irregular; lobes spreading, twisted in bud. Stamens 4, 2 of them longer than the others. Ovules many.

1 Stems prostrate prostrata.

Stems erect 2

2 Roots not thickened; leaves $\frac{1}{2}$ -1 $\frac{1}{2}$ in. long; flowers 1-1 $\frac{1}{4}$ in.

long patula.

Roots consisting of a number of slender, elongated tubers;

leaves 2 $\frac{1}{2}$ -3 $\frac{1}{2}$ in. long; corolla 2-2 $\frac{1}{2}$ in. long tuberosa.

Ruellia prostrata, Poir.

A spreading much-branched herb with prostrate stems. Leaves ovate or elliptic, up to 1 $\frac{1}{2}$ in. long. Flowers standing singly in the axils of leaves. Corolla pale blue, softly hairy outside, 1 $\frac{1}{4}$ in. long. Capsule $\frac{3}{4}$ in. long. Seeds 16-20. Flowers after the rains.

A very common weed of waste places.

Ruellia patula, Jacq.

A small shrubby herb covered with white hairs. Leaves elliptic or ovate, covered with short soft hairs, up to 1 in. long. Flowers 2 or 3 together or standing singly in the axils of leaves. Corolla pale blue, about 1 in. long. Capsules $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Flowers August to December.

An occasional weed. Ennur on the northern side of the backwater. Chetpat.

Ruellia tuberosa, Linn.

Pl. XXVI, C.

An erect herb with a number of tuberous roots starting from the base of the stem. Stem sparsely hairy. Leaves oblong, shiny, narrowed at the base, with 8-10 pairs of nerves, 3-4½ in. long. Flowers 2 together in the axils of leaves, falling in the afternoon. Calyx ¾ in. long; teeth narrow. Corolla blue, about 2¼ in. long; lobes spreading. Capsules about 1¼ in. long. Flowers in the rainy weather.

A native of Tropical America introduced as a garden plant. It has escaped and is a very persistent weed on account of its perennial underground root. It is very commonly met with in compounds and frequently occurs in large masses which present a very striking appearance.

Stenosiphonium, Nees

Shrubs. Lower leaves with long stalks, upper ones without stalks. Flowers in clusters on leafy elongate spikes. Calyx with 5 teeth. Corolla narrowly tubular below, then abruptly bent and widened into 5 nearly equal lobes twisted in bud. Stamens 4, either all developed or only 2 developed. Seeds 6-8.

Leaves up to 3 in. long; spikes with close clusters confertum.

Leaves up to 6 in. long; spikes with distant clusters Russellianum.

Stenosiphonium confertum, Nees

An erect shrub. Leaves ovate or rhomboid-elliptic, shortly narrowed at apex, shallowly crenate, up to 3 in. long. Calyx covered with sticky hairs. Corolla blue, about ¾ in. long. Stamens 4. Fruit less than ½ in. long. Fruit ripens in February.

Hills at Pallavaram.

Stenosiphonium Russellianum, Nees

A small shrub. Leaves rhomboid-elliptic, narrowed at apex, crenate-serrate, 2½-5 in. long. Flowers blue, nearly 1 in. long, arranged in whorls quite apart from each other. Fruit a small capsule. Flowers December to March.

Hills at Vandalur.

Andrographis, Wall.

Herbs. Flowers in racemes. Calyx with 5 narrow lobes. Corolla prominently 3-lobed, coloured, 2-lipped; the upper lip slightly 2-lobed, the lower bent down. Stamens 2. Capsule compressed, 4- to 12-seeded.

Leaves acute at apex, glabrous; racemes in panicles; capsule
glabrous paniculata.
Leaves obtuse at apex, hairy; racemes not panicked; capsule
hairy echiodides.

Andrographis paniculata, Nees

நிலவேம்பு நீலவேம்பு

An erect branched herb 1-3 ft. high. Branches 4-angled. Leaves lanceolate, glabrous, 2-3 in. long, carried on short stalks. Flowers in branched racemes. Corolla 2-lipped, rose-coloured, $\frac{3}{8}$ in. long. Capsule $\frac{3}{4}$ in. long. Flowers in December and January.

In waste places. The plant is very bitter and is much used in medicine.

Andrographis echioides, Nees

கோபுரந்தாங்கி Pl. XXVI, D.

An erect herb, often not branched, 6-18 in. high, clothed with white hairs. Leaves oblong, not stalked, narrowed at base, hairy, $1\frac{1}{4}$ -3 in. long. Flowers numerous, in the axils of leaves, arranged along the upper side of a slender axis. Calyx covered with sticky hairs. Corolla white blotched with purple, 2-lipped, about $\frac{1}{2}$ in. long. Capsule compressed, hairy, nearly $\frac{1}{2}$ in. long. Flowers October to January.

Common in waste places and along railway lines.

Barleria, Linn.

Small shrubs or shrubby herbs, usually armed with spines. Flowers showy. Bracts often reduced to spines. Calyx with 4 lobes. Corolla large, funnel-shaped above; lobes 5, nearly equal, imbricate in bud. Stamens 2 developed and 2 undeveloped. A cup-like disk encircling the base of the 2-celled ovary. Ovules 2 in each cell.

Barleria Prionitis, Linn.

செம்முள்ளி, காட்டுக்கனகாம்பரம் Pl. XXVI, E. மூலாநீரில்

A prickly shrub 2-5 ft. high. Leaves glabrous, upper half elliptic, base narrowed into the stalk, 3-7 in. long. Calyx divided almost to the base. Corolla yellow or whitish, $1\frac{1}{4}$ - $1\frac{3}{4}$ in. long; upper lip deeply 4-lobed, lower lip entire. Capsule ovoid, with a long, solid, tapering beak, 2-seeded, $\frac{3}{4}$ -1 in. long. Seeds hairy. Flowers November to March.

Very common in jungly places. The leaves are used medicinally.

Asystasia, Blume

Herbs. Flowers on one side of a raceme. Calyx with 5 lobes. Corolla cylindrical below, inflated above, funnel-shaped; lobes 5, nearly equal, imbricate in bud. Stamens 4, 2 of them longer than the others. Ovules 2 in each cell. Fruit an elliptic capsule with a contracted base.

Asystasia gangetica, T. And. (*Asystasia coromandeliana*, Nees)

PL. XXVI, F.

A straggling or somewhat climbing, perennial herb. Leaves ovate, acute, softly hairy, 1-2½ in. long. Flowers arranged on one side of a spike-like raceme. Corolla white or sometimes blue, 1½ in. long. Capsule with long solid base, constricted about the middle of the enlarged upper part. Flowers November to March.

Very common in waste places and in hedges. The white-flowered form is the common one. The blue-flowered form is occasionally met with in Madras.

Lepidagathis, Willd.

Herbs or shrubby herbs. Flowers collected into a dense mass, sometimes densely crowded at the base of the plant. Bracts conspicuous. Calyx deeply 5-lobed, the upper lobe the largest, the 2 lower opposite to it, the 2 inner smallest and narrowest. Corolla-tube cylindrical below, abruptly expanded above and 2-lipped. Stamens 4, 2 long and 2 short. Ovules 2 in each cell.

Lepidagathis cristata, Willd.

கரப்பான் பூண்டு

A stiff herb, the spreading branches arising from a perennial underground part. Leaves not stalked, linear-oblong, ¾-1½ in. long. Flowers arranged in globose heads at the base of the stem. Bracts spine-pointed, hairy. Calyx divided into 4 pieces. Corolla pale pink dotted with purple, 2-lipped, hairy outside, about ½ in. long. Flowers November to February.

In dry situations. Abundant on gravelly soil at Red Hills. The plant is used in Indian medicine.

Rungia, Nees

Erect or spreading herbs. Flowers in one-sided spikes. Bracts in 2 or 4 rows, in the latter case 2 of the rows without flowers. Calyx with 5 divisions. Corolla small, 2-lipped. Stamens 2. Anthers 2-celled, the cells usually superposed, the lower cell with a slight appendage at base. Ovules 2 in each cell. Fruit a capsule, the seed-bearing part elastically separating from the base after breaking.

Rungia repens, Nees

Stem spreading, often rooting at the nodes, then becoming erect. Leaves very shortly stalked, oblong-lanceolate, with tapering base, glabrous, up to 3 in. long. Flowers at the ends of branches, in spikes up to 4 in. long. Bracts with scaly margins. Corolla white, ½ in. long. Lower anther-cell with a white appendage at the base. Capsule with scaly faces and hard edges. Seeds concentrically ridged. Flowers in December and January.

Near Poonamallee.

Ecbolium, Kurz

Shrubby plants. Flowers in spikes at the ends of branches. Bracts large, imbricate. Calyx with 5 teeth. Corolla 2-lipped; tube linear. Stamens 2. Ovules 2 in each cell of the ovary.

Ecbolium Linneanum, Kurz

A low shrub. Leaves elliptic-lanceolate, gradually drawn out at apex, glabrous, 2-4 in. long. Flowers in spikes at the ends of branches. Bracts leaf-like, elliptic, tapering towards the base, nearly $\frac{3}{4}$ in. long. Corolla bluish-green, hairy outside, up to $1\frac{3}{4}$ in. long. Capsule nearly 1 in. long. Flowers October to January.

In jungles and waste places. The leaves are used in medicine.

Justicia, Linn.

Herbs or shrubby plants. Flowers in spikes. Calyx divided into 4 or 5 narrow pieces. Corolla 2-lipped, imbricate. Stamens 2. Filaments often dilated. Anthers 2-celled, the lower cells always with a white appendage at base. Ovules 2 in each cell.

1	Calyx 5-toothed	...	...	...	...	...	...	1
	Calyx 4-toothed	...	...	...	...	...	...	5
2	Bracts white with green margins	...	...	...	...	...	...	Betonica.
	Bracts all green	...	...	...	...	...	...	3
3	Leaves ovate or circular	...	...	...	...	...	...	glaucia.
	Leaves lanceolate or oblong	...	...	...	...	...	...	4
4	Plant of a purple hue, scented	...	...	...	...	...	...	Gendarussa.
	Plant not of a purple hue, not scented	...	...	...	...	...	...	salsoloides.
5	An erect herb; internodes very widely separated	...	...	...	...	...	...	Vahlia.
	Prostrate herbs; internodes not very widely separated	...	...	...	...	...	...	6
6	Leaves ovate or circular, less than $\frac{1}{2}$ in. long	...	...	...	...	...	...	prostrata.
	Leaves elliptic-lanceolate or ovate-lanceolate, over $\frac{1}{2}$ in. long	...	...	...	...	...	...	diffusa.

Justicia Betonica, Linn.

An erect shrubby herb up to 4 ft. high. Leaves lanceolate, tapering at apex, somewhat narrowed at base, slightly toothed, up to 6 in. long. Flowers in large and conspicuous spikes at the ends of branches; spikes often branched. Corolla white spotted with pink, $\frac{1}{2}$ in. long. Capsule up to $\frac{1}{2}$ in. long. Flowers December to February.

In waste places near Teynampet.

Justicia glauca, Rottl.

A spreading herb. Stems 4-sided, the lower portions hairy and the younger parts covered with very short soft hairs. Leaves ovate, covered with very short soft hairs, $\frac{3}{4}$ - $1\frac{1}{2}$ in. long. Flowers in spikes in the axils of leaves and at the ends of branches. Spikes 1-4 in. long. Bracts covered with glandular hairs, $\frac{1}{4}$ in. in diameter. Corolla white with purple spots, $\frac{1}{3}$ in. long. Capsule obovoid, about $\frac{1}{4}$ in. long. Flowers in October and November.

Not common. Chetpat, on the railway line near the bridge.

Justicia Gendarussa, Linn.

கருநாச்சி நல்லாவி

An erect shrubby herb 2-4 ft. high. Leaves lanceolate, glabrous, up to 4 in. long. Spikes 2-5 in. long, at the ends of branches, often branching. Bracts narrow. Corolla pink spotted with purple, $\frac{1}{2}$ in. long. Capsule $\frac{1}{2}$ in. long. Flowers February to April.

A native of the Western Ghats. Common in gardens as an edging plant. The leaves are much used in medicine.

Justicia salsoloides, T. And.

A stiff herb. Branches softly hairy. Leaves oblong, $\frac{1}{2}$ -1 in. long. Spikes few-flowered, at the ends of branches. Bracts elliptic, about $\frac{1}{5}$ in. long. Corolla whitish with purple spots, softly hairy on the outside. Capsule softly hairy, $\frac{1}{3}$ in. long. Flowers November to March.

Red Hills, on gravelly soil.

Justicia Vahlia, Roth (*Justicia diffusa*, var. *Vahlia*)

An erect branching herb. Leaves lanceolate, up to 3 in. long. Spikes up to $2\frac{1}{2}$ in. long. Bracts lanceolate. Flowers pale pink with a reddish lip. Capsule softly hairy. Flowers in December.

Ennur, on the railway line north of the bridge.

Justicia prostrata, Gamble (*Justicia diffusa*, Willd., var. *prostrata*)

PL. XXVI, A.

A small prostrate herb. Stems many proceeding from the upper part of the root and spreading. Branches hairy. Leaves small, ovate or circular, hairy, less than $\frac{1}{2}$ in. long. Spikes short. Flowers pale pink. Capsule small, hairy. Flowers in November.

On the embankments of rice fields near the village of Kuthavaram. Red Hills.

Justicia diffusa, Willd.

A slender branching herb. Leaves ovate-elliptic or elliptic-lanceolate, up to $2\frac{1}{2}$ in. long. Flowers in narrow spikes in the axils of leaves or at the ends of branches.

Bracts shorter than the calyx. Corolla small, pale purple. Capsule glabrous. Flowers at all seasons except the driest.

A very common weed in gardens and waste places.

Adhatoda, Nees

Shrubs. Flowers in the axils of opposite bracts, in dense spikes in the axils of the leaves or at the ends of branches. Calyx with 5 divisions. Corolla-tube short; limb 2-lipped. Stamens 2, near the top of the corolla-tube. Ovules 2 in each cell. Seeds 1 or 2.

Adhatoda Vasica, Nees

ஆடாதோடை Pl. XXVII, B. అడ్డసరము

A dense shrub with an unpleasant bitter smell. Leaves oblong-lanceolate, narrowed at both ends, minutely hairy, up to 8 in. long. Spikes stout, 3-4 in. long. Bracts elliptic, about 1 in. long. Calyx $\frac{1}{2}$ in. long. Corolla sometimes white with a few yellow or rose-coloured lines at the throat, $1\frac{1}{4}$ in. long. Capsule softly hairy, $\frac{3}{4}$ in. long. Flowers July to September.

Cultivated in gardens and also occasionally found run wild in the vicinity of villages. The leaves are used in Indian Medicine.

Rhinacanthus, Nees

Shrubby herbs. Flowers in panicles. Bracts shorter than the calyx. Calyx with 5 narrow lobes. Corolla-tube very slender; limb 2-lipped. Stamens 2. Ovules 2 in each cell. Capsule contracted below in the long solid stalk.

Rhinacanthus communis, Nees

நாகமல்லி నాగమల్లె

A shrubby herb reaching 3-5 ft. in height. Leaves elliptic-lanceolate, base tapering, glabrous, 2-4 in. long. Flowers arranged in panicles at the ends of branches. Corolla white, hairy outside, over 1 in. long. Capsule narrow, pointed, about $\frac{3}{4}$ in. long. Flowers November to January.

Frequent in jungly places. The leaves and root are used in medicine.

Peristrophe, Nees

Erect spreading herbs. Flowers purple or pink, arranged in panicles. Bracts longer than the calyx. Calyx with 5 linear-lanceolate lobes. Corolla-tube slender. Stamens 2. Anther-cells one higher than the other. Ovules 2 in each cell.

Peristrophe bicalyculata, Nees

A hairy herb. Leaves ovate, acuminate, hairy, 2-3 in. long. Flowers arranged in branching cymes in the axils of leaves. Bracts 2. Bracteoles 4. Calyx with 5 linear-lanceolate segments. Corolla pink, the outside covered with short soft hairs, nearly $\frac{1}{2}$ in. long. Capsule $\frac{1}{3}$ in. long. Flowers November to January.

A common weed in gardens.

Crossandra undulaefolia, Salisb.

கனகரம்பரம் கனகாம்பரம்

A small shrub often grown in Madras gardens. Propagated from seeds or by cuttings. Flowers orange-coloured, $\frac{3}{4}$ in. in expansion.

Eranthemum roseum, R. Br. (*Daedalacanthus roseus*, T. And.)

நீலரம்பரம்

A shrub 2-6 ft. high. Leaves oblong-lanceolate, narrowed towards the petiole, ribs prominent below, up to 6 in. long. Flowers in 1-3 spikes at the ends of branches in the axils of conspicuous white bracts veined with green. Corolla bright blue, with a narrow tube 1 in. long. A native of Canara commonly met with in gardens.

Verbenaceae

Herbs, shrubs or trees. Leaves opposite, usually simple. Corolla-lobes unequal. Calyx remaining in the fruit, 4- or 5-lobed. Corolla-tube often curved; limb 2-lipped or rather unequally 4- or 5-lobed. Stamens usually 4. Ovary superior, 2- to 4-celled, entire or 4-lobed. Fruit a drupe or a capsule, 1- to 4-celled.

- | | | |
|---|---|------------------|
| 1 | Shrubs or trees of swamps or tidal marshes; rod-like, conically-pointed roots shooting up above ground originating from the underground roots (pneumataphores) | Avicennia. |
| | Not plants of tidal marshes; pneumataphores not present | 2 |
| 2 | Flowers in normal or head-like spikes | 3 |
| | Flowers in loose panicles or corymbs | 5 |
| 3 | Spikes short, cylindrical or head-like; calyx short | 4 |
| | Spikes long, slender; calyx long, tubular | Stachytarphaeta. |
| 4 | Calyx not lobed; fruit a drupe | Lantana. |
| | Calyx 2- or 4-lobed; fruit dry, hard | Lippia. |
| 5 | Leaves compound | Vitex. |
| | Leaves simple | 6 |

- | | | | | | | |
|---|-----|-----|-----|-----|-----|---------------|
| 6 Flowers less than $\frac{1}{4}$ in. long | ... | ... | ... | ... | ... | Premna. |
| Flowers more than 1 in. long | ... | ... | ... | ... | ... | 7 |
| 7 Corolla obliquely bell-shaped; mostly armed shrubs | ... | ... | ... | ... | ... | Gmelina. |
| Corolla slightly oblique, salver-shaped or funnel-shaped; | | | | | | |
| unarmed shrubs | ... | ... | ... | ... | ... | Clerodendron. |

Avicennia, Linn.

Shrubs or small trees with long creeping roots which send pneumatophores at intervals. Leaves leathery, entire. Flowers small, yellow, in paniced heads. Calyx short, 5-partite; lobes imbricate. Corolla-tube short, cylindrical; lobes 4, almost equal. Stamens 4, on the throat of the corolla. Ovary 4-celled. Ovules 4. Fruit a compressed capsule. Seeds single, germinating on the plant.

Avicennia officinalis, Linn. The White Mangrove

Pl. XXVII, E.

A small tree. Leaves elliptic-oblong, obtuse, glabrous above, with a thin white tomentum beneath, 2-3 in. long. Flowers in corymbose heads, small, dingy yellow. Corolla less than $\frac{1}{4}$ in. in diameter; lobes 4. Fruit a green, ovoid, compressed, beaked capsule 1-1 $\frac{1}{2}$ in. long. Seed completely filling the fruit. Flowers August to November.

In salt swamps. Along the Cooum from the Central Station to the sea. Mouth of the Adyar. Ennur, particularly in the swampy area near the salt-pans.

Stachytarphaeta, Vahl

Herbs or shrubs. Spikes long and slender. Flowers half immersed in the axis of the spike. Calyx shortly 4-lobed. Corolla-tube slender, cylindrical; limb oblique, with 5 lobes. Perfect stamens 2, the other 2 imperfect or absent. Ovary 2-celled. Ovules 1 in each cell. Fruit enclosed in the calyx, separating into 2 hard, 1-seeded parts.

Stachytarphaeta indica, Vahl

சீமைநாயுருவி Pl. XXVIII, A.

An annual herb 1-3 ft. high. Leaves elliptic, obtuse, serrate, glabrous, decumbent on the petiole, 2-4 in. long. Spikes up to 1 foot long. Corolla blue, about $\frac{3}{8}$ in. across. Flowers August to February.

A very common weed. Abundant in and near Guindy Park. It is not an indigenous plant but its native country is not known. Distributed throughout Tropical Asia, America and Africa.

Lantana, Linn.

Erect or rambling shrubs, often strong-smelling. Branches roughly hairy, often prickly, 4-angled. Flowers in cylindrical spikes. Calyx small. Corolla-tube slender;

limb salver-shaped, spreading. Stamens 4, included in the corolla-tube. Ovary 2-celled. Ovules 1 in each cell. Fruit a drupe.

Lantana aculeata, Linn. (*Lantana Camara*, Linn.)

Pl. XXVII, C.

A straggling or climbing, aromatic shrub with numerous prickles on the branches. Leaves ovate, acute, crenate, rough, wrinkled, 2-3 in. long. Spikes short, arranged as in an umbel. Corolla variable in colour, generally pink with orange centre in Madras, but scarlet and orange varieties are occasionally found. Drupe dark blue or purple. Flowers practically all the year round.

A common weed growing in vacant places. It is often used for hedging. In the normal form the corolla is deep orange. It is very difficult to eradicate and easily becomes a pest. It was introduced from Tropical America as a garden plant and has run wild throughout India.

Lippia, Linn.

Herbs (or shrubs). Stems widely creeping and rooting at the nodes. Leaves small, serrate. Flowers small, in dense long-stalked heads in the axils of leaves. Calyx 2- to 4-lobed. Corolla more or less 2-lipped. Stamens 2 long and 2 short. Ovary 2-celled. Ovules one in each cell. Fruit small, hard, separating into 2 one-seeded parts.

Lippia nodiflora, Michux.

பொடிதலை Pl. XXVII, D. வாழைநெய்தல்

A creeping perennial herb. Stems much branched, minutely hairy. Leaves spatula-shaped, wedge-shaped at base, serrate in the upper part, hairy on both surfaces, $\frac{3}{4}$ -1 in. long. Flowers arranged in peduncled heads in the axils of leaves. Heads becoming more or less cylindrical in fruit. Peduncles 1-3 in. long. Corolla minute, purplish. Flowers all the year round.

Very common in wet places such as the borders of ponds.

Vitex, Linn.

Shrubs or trees. Leaves palmately compound. Leaflets 3-7, occasionally only one present. Flowers in panicles. Corolla small, 2-lipped, upper lip of 2, lower of 3 lobes; tube usually short. Stamens 4. Ovary 2- to 4-celled. Ovules 1 in each cell. Fruit a small drupe.

Leaflets 5, sometimes 3, lanceolate, stalked; panicles 6-10 in.

long Negundo.

Leaflets 3, sometimes single, obovate-oblong, the middle one

wedge-shaped at base, not stalked; panicles 1-5 in. long ... trifolia.

Vitex Negundo, Linn.

தெநாச்சிவம் Pl. XXVII, F. வாவி

A large shrub. Leaflets 3-5, lanceolate, drawn out at apex, white with hairs below, the middle one 2-4 in. long, the side ones smaller. Flowers rather small, bluish-purple, in panicles at the ends of branches. Fruit a small, black, globose drupe. Flowers May to December.

Common on waste lands near villages; sometimes in hedges. The leaves are used in medicine.

Vitex trifolia, Linn.

A shrub. Leaflets 3, elliptic or oblong-obovate, the middle one slightly drawn out at apex, white beneath due to soft hairs, glabrous above, 2-2½ in. long, the side ones smaller. Sometimes simple leaves also occur. Corolla pale purple, ⅜ in. long. Drupe globose, purplish-black when ripe, embraced half-way up by the calyx, ¼ in. in diameter. Flowers in August and after.

Villivakam.

Premna, Linn.

Trees or shrubs. Flowers in corymb-like panicles or cymes at the ends of branches. Calyx small. Corolla small; tube short, often hairy within; limb 1-lipped. Stamens 4. Ovary 2- or 4-celled, 4-ovuled. Stigma shortly 2-cleft. Fruit a small drupe.

- | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|---------------|
| 1 Cymes in panicles ... | ... | ... | ... | ... | ... | ... | 2 |
| Cymes in corymbs ... | ... | ... | ... | ... | ... | ... | 3 |
| 2 Calyx deeply 2-lipped; panicles under 1 in. broad, dense; | | | | | | | |
| leaves nearly glabrous ... | ... | ... | ... | ... | ... | ... | corymbosa. |
| Calyx shortly 5-lobed; panicles pyramidal, up to 4 in. | | | | | | | |
| broad; leaves densely covered with short dark hairs ... | | | | | | | tomentosa. |
| 3 Corymbs at the ends of the main branches only, broad; | | | | | | | |
| calyx obscurely 2-lipped, saucer-shaped in fruit; leaves | | | | | | | |
| elliptic-ovate ... | ... | ... | ... | ... | ... | ... | serratifolia. |
| Corymbs at the ends of side branchlets as well as main | | | | | | | |
| branches, small; calyx 2-lipped; leaves ovate ... | | | | | | | latifolia. |

Premna corymbosa, Rottl.

A shrub 6 ft. high or more. Leaves ovate, drawn out at apex, entire, 4-nerved glabrous, 2-3½ in. long. Flowers small, yellowish-green, in panicles at the ends of branches. Calyx 2-lipped, enlarged in fruit. Fruit a small, ovoid, purple drupe. Flowers September to January.

In jungle at Avadi.

Premna tomentosa, Willd.

A small tree. Young parts woolly. Leaves ovate, acuminate, flannel-like on the under surface, yellowish, 4-8 in. long. Flowers at the ends of branches, small, greenish-yellow. Calyx shortly 5-lobed. Fruit a small black ovoid drupe. Flowers April to August.

In jungle at Avadi and Vandalur.

Premna serratifolia, Linn. (*Premna integrifolia*, Linn.)

A small tree. The trunk and large branches often spiny; the ultimate branches not spiny. Leaves oblong, slightly acuminate, obtuse, entire, glabrous, slightly hairy on the mid-rib, with 4 or 5 pairs of nerves, up to 4 in. long. Corymbs dense, minutely hairy, 2-4 in. in diameter. Calyx 3-toothed. Corolla 4-lobed, greenish-yellow, small, throat hairy. Fruit small, globose. Flowers July to December.

Adyar.

Premna latifolia, Roxb.

పెద్ద నల్లకూర

A small tree. Leaves ovate or ovate-oblong, obtuse at base, shortly acuminate at apex, the upper part slightly serrate, 4-nerved, slightly hairy on the nerves above, up to 3 in. long. Corymbs 2-3 in. in diameter. Corolla 2-lipped, densely hairy in the throat, greenish-white. Flowers in December.

The form described is the form growing in the jungle at Avadi. The leaves are slightly different from the typical form. In the typical form the leaves are ovate-cordate.

Var. *viburnoides*, Wall.

మొంజీ

Leaves ovate, obtuse at base, the upper part distinctly serrate, obtuse but with a small point at apex, thin, practically glabrous, green both above and below, up to 3 in. long. Flowers greenish-yellow. Fruit globose, black when ripe, $\frac{1}{4}$ in. in diameter. Flowers June to September.

Common near the city. Occasionally planted for the green leaves which are eaten.

Gmelina, Linn.

Trees or shrubs often armed with spines (undeveloped branches). Flowers large, yellow, arranged in racemes. Calyx bell-shaped. Corolla obliquely bell-shaped, limb 4- or 5-lobed. Ovary 4-celled, the cells 1-ovuled. Fruit a drupe.

Gmelina asiatica, Linn.

குமிழ்மரம் Pl. XXVIII, B. చిలుగుముఖం

A large shrub armed with blunt thorns. Leaves ovate, often irregularly lobed, glabrous, dotted with minute glands on the under surface, $\frac{3}{4}$ - $1\frac{1}{2}$ in. long. Flowers bright yellow, $1\frac{1}{2}$ -2 in. long, in racemes at the ends of the branches. Corolla 2-lipped; lobes 4. Fruit an ovoid drupe, yellow when ripe, $\frac{3}{4}$ in. long. Flowers at various parts of the year.

Vandalur. Guindy Park. In scrub jungle at Ennur and in hedges in the city. The roots and leaves are used in Indian medicine.

Clerodendron, Linn.

Trees or shrubs. Flowers in cymes or panicles. Calyx bell-shaped, 5-toothed or truncate. Corolla-tube slender; limb more or less oblique, with 5 spreading lobes. Ovary imperfectly 4-celled. Ovules one in each cell. Fruit a drupe separating into 4 pieces of which 1-3 are sometimes suppressed.

- | | | |
|---|---|-------------------|
| 1 | Corolla narrowly funnel-shaped, 3 in. or more long; | |
| | leaves narrowly lanceolate, up to 9 in. long | ... Siphonanthus. |
| | Corolla somewhat obliquely salver-shaped; leaves up to | |
| | 3 in. long | ... 2 |
| 2 | Calyx lobed to about half-way down; leaves ovate-deltoid, | |
| | serrate | ... Phlomidis. |
| | Calyx minutely toothed; leaves not ovate | ... 3 |
| 3 | Leaves obovate or circular, obtuse at apex | ... inerme. |
| | Leaves elliptic-lanceolate, shortly acuminate at apex | ... aculeatum. |

Clerodendron Siphonanthus, R.Br.

A tall shrub with erect hollow stems up to 6 ft. high or even more. Leaves narrowly lanceolate, slightly acuminate, almost stalkless, entire, glabrous, 5-7 in. long, 1 in. broad. Flowers in loose panicles at the ends of branches. Calyx divided to three-fourths of its length, $\frac{1}{2}$ in. long. Corolla white, glabrous; tube 3- $4\frac{1}{2}$ in. long; lobes obovate-oblong, $\frac{3}{4}$ in. long.

In hedges near Poonamallee.

Clerodendron Phlomidis, Linn. (*Clerodendron phlomoides*, Willd.)

తెక్క-లి

A bushy shrub. Branches softly hairy. Leaves ovate, serrate in the upper part, acute, hairy on both surfaces, $1\frac{1}{2}$ -2 in. long. Flowers arranged so as to form a rounded panicle at the ends of branches. Calyx divided half-way down, $\frac{3}{8}$ in. long. Corolla

white or pinkish; tube $\frac{3}{4}$ in. long; lobes nearly equal, $\frac{1}{4}$ in. long. Drupe broadly obovoid, $\frac{3}{4}$ in. long.

In hedges near the city. Not common.

Clerodendron inerme, Gaertn.

சங்கங்குப்பி

A straggling shrub. Leaves obovate or elliptic, obtuse or slightly notched at apex, glabrous, entire, $\frac{3}{4}$ -2 in. long. Flowers in 3-flowered cymes in the axils of leaves. Corolla white; tube long, slender, glabrous outside, hairy inside, reaching up to $1\frac{1}{2}$ in. in length; lobes almost equal, $\frac{1}{4}$ in. long. Stigma acutely 2-lobed. Drupe seated in the enlarged calyx, $\frac{1}{2}$ in. long. Flowers in October and November.

Adyar near the sea.

Clerodendron aculeatum, Griseb.

An erect shrub. Younger parts pubescent. Leaves lanceolate or elliptic-lanceolate, entire, shortly acuminate, glabrous, up to $2\frac{3}{4}$ in. long, those in the younger parts only about $1\frac{1}{4}$ in. long. Flowers in 3- or 9-flowered cymes in the axils of leaves. Calyx minutely hairy, 5-toothed. Corolla white; tube finely hairy outside, slender, up to $\frac{1}{2}$ in. long; lobes somewhat unequal, $\frac{3}{4}$ in. long. Filaments white. Style long, purplish near the end. Flowers September to December.

A native of the West Indies. It is very commonly used in gardens for hedges.

Duranta Plumieri, Jacq.

An erect shrub. Leaves obovate or oblong-lanceolate, sharply acuminate. Flowers blue or white, in racemes, borne in profusion at the ends of branches. Berries small, orange-coloured. A native of South America often grown in gardens. Both the blue- and white-flowered varieties grow in the Museum compound.

Labiatae

Chiefly herbs, usually with square stems. Leaves opposite, scented. Flowers in the axils of leaves, in cymose clusters, often aggregated in spikes or racemes at the ends of branches. Calyx remaining in the fruit, often more or less 2-lipped. Corolla 2-lipped. Stamens 4, 2 of them longer than the other 2, inserted on the tube of the corolla. Ovary deeply 4-lobed, the style arising from the bottom of the lobes. Stigma 2-lobed. Fruit consisting of 4 nut-like parts that look like seeds each containing a single seed.

- | | | | | |
|---|--|-----|-----|-----------|
| 1 | Lower lip of corolla not longer than the upper lip | ... | ... | 2 |
| | Lower lip of corolla longer than the upper lip | ... | ... | 5 |
| 2 | Flowers scarlet | ... | ... | Leonotis. |
| | Flowers not scarlet | ... | ... | 3 |

- | | | |
|---|--|--------------|
| 3 | Calyx turned downwards in fruit | 4 |
| | Calyx not turned downwards in fruit ; flowers minute ... | Geniosporum. |
| 4 | Corolla-tube short ; lower lip flat ; stigma bifurcated ... | Ocimum. |
| | Corolla-tube long ; lower lip concave ; stigma not bifurcated. | Orthosiphon. |
| 5 | Corolla obscurely 2-lipped ; lower lip sac-shaped ... | Hyptis. |
| | Corolla distinctly 2-lipped ; lower lip not sac-shaped ... | 6 |
| 6 | Upper lip of corolla flat | Anisomeles. |
| | Upper lip of corolla hooded, densely woolly | Leucas. |

Leonotis, R.Br.

Herbs or shrubs. Stems 4-angled. Flowers fairly large, scarlet, in dense many-flowered whorls in the axils of leaves. Calyx 10-ribbed, two sides of mouth unequal. Corolla 2-lipped, upper lip long, the lower lip small.

Leonotis nepetaefolia, R.Br.

உருக்கி

An erect plant attaining 6 ft. in height. Stem obtusely 4-angled. Leaves ovate, crenate-serrate, with acute apex, softly hairy on both sides, narrowed at the base, $2\frac{1}{2}$ -6 in. long. Flowers in dense, globose, many-flowered, spiny whorls, $1\frac{1}{2}$ - $2\frac{1}{2}$ in. in diameter. Corolla orange-scarlet, 1 in. long the upper lip densely woolly. Flowers in November and December.

In waste places. Adyar, near the toll-gate. People's Park, near the canal.

Geniosporum, Wall.

Spreading (or erect) herbs. Flowers small, many, in long racemes at the ends of branches. Calyx 10-ribbed, more or less 2-lipped. Corolla small, 2-lipped. Anthers 1-celled.

Geniosporum prostratum, Benth.

Pl. XXVIII, D.

A many-branched prostrate spreading herb. Stems many, arising from the top of the root, hairy. Leaves ovate-oblong to lanceolate, serrate, hairy, usually less than $\frac{1}{2}$ in. long, sometimes up to 1 in. long. Racemes slender, up to 6 in. long, the whorls closely packed. Flowers minute. Corolla pink. Flowers November to January.

Ennur, very abundant on sandy places near the railway station. Red Hills, near the lake. Adyar, in sandy places.

Ocimum, Linn.

Herbs, sometimes shrubby, strongly scented. Flowers small, in whorls, in long spikes or racemes. Bracts small. Calyx deflexed in fruit, 2-lipped; upper lip broad, flat; lower lip with 4 teeth. Upper lip of corolla 4-lobed; lower lip hardly longer than the upper, entire. Stamens 4, 2 longer than the other 2. Anthers 1-celled. Ovary divisible into 4 parts. Fruit of 4 dry, hard, 1-seeded units.

- | | | |
|---|--|--------------|
| 1 | Tall shrubby plant, upper teeth of calyx longer than the lower | gratissimum. |
| | Herbs or small shrubby herbs; upper teeth of calyx shorter than the lower | 2 |
| 2 | Pedicels slightly longer than the calyx | sanctum. |
| | Pedicels shorter than the calyx | 3 |
| 3 | Calyx in the fruit nearly $\frac{1}{2}$ in. long | basilicum. |
| | Calyx in the fruit $\frac{1}{4}$ in. long | 4 |
| 4 | Bracts stalked | canum. |
| | Bracts not stalked | adscendens. |

Ocimum gratissimum, Linn.

எலுமிச்சந்தூளி

A copiously branching shrub reaching up to 6 ft. in height. Stem 4-angled and 4-grooved. Leaves ovate, wedge-shaped at base, acute at apex, crenate-serrate, long-petioled, glabrous except on the nerves, up to 4 in. long. Racemes up to 6 in. long. Corolla greenish-yellow. Flowers September to February.

In jungly places on the banks of the Buckingham Canal. In waste places near Nungambakam. The leaves are used in medicine.

Ocimum sanctum, Linn. The Sacred Basil

தூளி

சூலி

An annual herb. Stem sometimes purplish, lower part sometimes woody. Leaves elliptic-oblong, entire or serrate, softly hairy, 1-2 in. long. Racemes 6-8 in. long. Pedicels longer than the calyx. Corolla purplish.

Cultivated in houses and temples. Also found run wild near villages. This is the most sacred plant of the Hindus. The leaves are used in medicine.

Ocimum basilicum, Linn.

A fairly large herb. Leaves ovate, wedge-shaped at base, toothed, glabrous, up to 3 in. long. Racemes up to 5 in. long. Upper lip of calyx saucer-shaped in the fruit, nearly $\frac{1}{2}$ in. long. Corolla white. Flowers December to February.

In waste places near Mylapore.

Var. *thyrsiflorum*, Benth.

திருநீற்றுப்பச்சை குருஞ்சை

A herb with purple stems. Leaves having a strong aroma. Flowers pink, arranged in racemes.

Cultivated.

Ocimum canum, Sims. Hoary Basil

நாய்த்துளசி, கஞ்சாங்கோரை Pl. XXVIII, C. குக்குலசி

An erect branching herb, the younger parts softly hairy. Leaves elliptic-lanceolate, entire or slightly serrate, on stalks nearly 1 in. long. Flowers in spike-like racemes 3-8 in. long. Corolla white. Flowers in the rainy months.

In waste places and on railway lines. The leaves are used in medicine.

Ocimum adscendens, Willd.

An annual herb, usually erect, sometimes prostrate with the branches tending to become erect. Leaves oblong, with obtuse apex, base tapering, faintly serrate, $\frac{1}{2}$ -1 in. long. Upper lip of calyx obovate; the two lower teeth reduced to 2 brownish points. Calyx papery and yellow in the fruit. Flowers October to December.

Along the railway line between Egmore and Chetpat.

Orthosiphon, Benth.

Herbs, sometimes shrubby. Flowers in whorls of 6 or less, in racemes at the ends of branches. Calyx 5-lobed, turned downwards in fruit. Corolla 2-lipped; upper lip 4-lobed, the lower entire.

An erect herb; leaves $3\frac{1}{2}$ in. long; corolla-tube longer than the calyx glabratus.

A low loosely spreading herb; leaves less than 1 in. long; corolla-tube about equal to the calyx pallidus.

Orthosiphon glabratus, Benth. (*Orthosiphon tomentosus*, var. *glabratus*, Hook.)

An erect herb up to 2 ft. high. Stem glabrous. Leaves not scented, broadly ovate, coarsely crenate, narrowed at the base, nearly glabrous, obtuse at apex, $1\frac{1}{2}$ - $3\frac{1}{2}$ in. long. Flowers pale purple, about $\frac{1}{2}$ in. long. Flowers in October.

In jungle at Avadi underneath shrubs and thoroughly shaded by them.

Orthosiphon pallidus, Royle

A low but stiff herb 6-12 in. high. Branches numerous arising from the upper portion of the thickened root. Leaves not scented, ovate, serrate, obtuse at apex, almost glabrous, $\frac{1}{2}$ in. long or more. Flowers in short racemes; whorls 6-flowered. Corolla white or pale lilac, $\frac{1}{4}$ in. long. Fruit ripening in November.

On the bund of a rice field in the village of Kuthavaram near Red Hills. Not common.

Hyptis, Jacq.

Herbs or shrubs. Calyx with 5 nearly equal teeth. The lower lobe of corolla turned backwards and sac-shaped, the others erect and spreading.

Hyptis suaveolens, Poit.

Pl. XXVIII, E.

A tall rigid sweet-smelling herb with 4-angled, roughly hairy stems. Leaves ovate, serrate, hairy, 1-4 in. long, the leaves near the base of the stem much the largest. Flowers collected in heads in the axils of leaves, small, blue. Calyx provided with 5 bristle-like teeth in the fruit. Flowers October to January.

A native of Tropical America and the West Indies. An escape from gardens. Very commonly met with in waste places in Egmore and Mylapore and also on the banks of the Cooum.

Anisomeles, R.Br.

Tall erect branching herbs. Flowers arranged in whorls. Calyx straight, 5-toothed; teeth equal. Upper lip of corolla erect, entire; lower broad, spreading, 3-lobed. Anthers of the shorter stamens 1-celled.

Edges of stems obtuse; leaves ovate indica.

Edges of stems acute; leaves oblong-lanceolate malabarica.

Anisomeles indica, O. Kze. (Anisomeles ovata, R.Br.)

A shrubby herb, 2-5 ft. high. Branches softly hairy. Leaves thickish, strongly smelling, acute at apex, crenate, $1\frac{1}{2}$ -4 in. long. Flowers in dense whorls, the top whorls much nearer each other. Corolla light purple with a deep blue lower lip, $\frac{5}{8}$ in. long. Flowers in November and December.

On waste lands and by roadsides. The plant is used in medicine.

Anisomeles malabarica, R.Br.

பேய்மருத்தி

మనదీర

A shrubby herb covered with dense woolly hairs and growing up to 6 ft. in height. Leaves oblong-lanceolate, acute at apex, crenate-serrate, pale green above, white below, softly woolly, thick, $2\frac{1}{2}$ -4 in. long. The top whorls of flowers quite close to each other. Corolla pale purple, over $\frac{3}{4}$ in. long. Flowers in March and April.

Pallavaram, at the foot of the hills.

Leucas, R.Br.

Herbs. Flowers white, in few- or many-flowered whorls. Calyx tubular, 10-ribbed, the mouth straight or unequal-sided, equally or unequally 6- to 10-toothed, often with a ring of

hairs on the inside of the teeth. Upper lip of corolla erect; lower lip spreading, 3-lobed, the middle lobe large. Upper lobe of style not developed.

- | | | | | |
|---|---|-----|-----|------------|
| 1 | Mouth of calyx not hairy inside, sides unequal | ... | ... | 2 |
| | Mouth of calyx hairy inside, straight or slightly oblique | ... | ... | 3 |
| 2 | Calyx smooth below, ribbed and roughly hairy above | ... | ... | aspera. |
| | Calyx smooth throughout or nearly so; sides of mouth of | | | |
| | calyx very unequal | ... | ... | linifolia. |
| 3 | Sides of mouth of calyx slightly unequal; teeth triangular; | | | |
| | stems trailing on the ground | ... | ... | diffusa. |
| | Sides of mouth of calyx equal; teeth linear, awl-shaped; | | | |
| | stems erect | ... | ... | hirta. |

Leucas aspera, Spreng.

சும்தை

Pl. XXVIII, F.

தெழுது

A coarse erect branching herb. Branches 4-angled, covered with rough hairs. Leaves linear-oblong, very slightly crenate, obtuse, more or less hairy, 1-3 in. long. Flowers in whorls, in the axils of leaves and at the ends of branches. The upper part of mouth of calyx produced forwards; tube of calyx curved, covered with rough hairs. Corolla $\frac{3}{8}$ in. long; upper lip densely woolly; the lower lip twice as long, the middle lobe of latter much the largest. Flowers October to February.

Very common on waste land. The plant is considered sacred and the flowers are used in the worship of Shiva.

Leucas linifolia, Spreng.

General appearance and habitat almost the same as the above but not very much branched. Branches softly hairy. Leaves linear-lanceolate, rounded at apex, almost entire, softly hairy. Calyx entirely glabrous, sides of mouth very unequal, the upper tooth very large, produced forwards considerably, the other teeth minute. Corolla almost the same as in the last species. Flowers October to December.

Tiruvanmiyur, near the temple. Vandalur on the tank bunds. Very common on the road from Guindy to Velacheri. Perambur, near the railway station. Less common than aspera.

Leucas diffusa, Benth.

A small loosely-spreading coarsely-hairy herb with trailing branches all arising from the root. Leaves linear or sometimes linear-oblong, obtuse at apex, practically entire, hairy, $\frac{1}{2}$ -1 in. long. Whorls of flowers mostly at ends of branches, few-flowered. Calyx-tube curved, ribbed and bristly, mouth wide, teeth small. Corolla fairly large. Flowers September to November.

Along railway line between Egmore and Chetpat. On waste land near the beach. In the latter case the leaves are much broader.

Leucas hirta, Spreng.

A branching herb. Stems arising from a stout basal part, clothed with rough hairs. Leaves linear-oblong, very shortly stalked, obscurely toothed, obtuse at apex, few-nerved, softly hairy on both surfaces, about 1 in. long. Whorls of flowers 1 or 2 at ends of branches. Calyx hairy at the mouth and on the outside; teeth awl-shaped. Flowers moderate-sized, appearing in November.

Hills at Vandalur.

Nyctaginaceae

Herbs or shrubs. Leaves usually opposite, entire. Stems often thickened at the joints. Calyx coloured, tubular or funnel-shaped. Base of the calyx remaining in the fruit, constricted above the 1-celled, 1-seeded ovary so that the latter appears to be inferior while actually it is superior. Corolla absent. Stamens few, arising from beneath the ovary.

- | | | | | | | |
|---|--|-----|-----|-----|-----|--|
| 1 | Leaves opposite; herbaceous plants | ... | ... | ... | ... | 2 |
| | Leaves alternate; shrubs climbing by the help of thorns | ... | | | | <i>Bougainvillaea</i>
(cultivated). |
| 2 | Flowers large and very showy; stem reddish (or yellowish in the yellow-flowered variety) | ... | ... | ... | ... | <i>Mirabilis</i>
(cultivated). |
| | Flowers small; stem not reddish or yellow | ... | ... | ... | ... | <i>Boerhaavia</i> . |

Bougainvillaea spectabilis, Willd.

The flowers which by themselves are not attractive are arranged in clusters of 3 on stalks in the axils of leaves. The striking appearance of the flower is due to the three large bracts to which the flowers are attached by their short stalks. Flowers almost all through the year but very profusely in the hot weather. A native of Brazil.

Mirabilis Jalapa, Linn. The Four O'clock Plant or the Marvel of Peru

அந்திமல்லிகை ஃடாக்

Leaves ovate, acuminate, glabrous, up to 5 in. long. The cup-like bract of each flower closely imitates the calyx while the brightly coloured part which is commonly mistaken for the corolla is the calyx. The flowers are red, white or yellow, have a long tube and spreading limb and open in the evening. Fruit black, covered with tubercles, seed-like. Flowers after the rains. A native of South America. Cultivated and sometimes found run wild.

Boerhaavia, Linn.

Herbs with leaves often in unequal pairs. Perianth funnel-shaped, 5-lobed. Stamens 1, 2 or 5, united below. Filaments unequal. Ovary irregular, carried on a short stalk. Fruit enclosed in the perianth-tube, round, 5-ribbed or angled, covered with sticky glandular hairs.

Boerhaavia diffusa, Linn.

சாட்டமரீண்டு Pl. XXVIII, G. అటకమామిడి

A spreading herb with a stout underground root and many branches. Leaves rather thick, in unequal pairs, broadly ovate or somewhat circular, rounded at the apex, green and glabrous above, white beneath, up to 2 in. long. Petioles about 1 in. long. Flowers in umbels of 4-10, arranged in panicles. Corolla pink. Stamens 2 or 3. Fruit 5-ribbed, furnished with glands on the ribs. Flowers at all seasons but the driest.

A very common weed in all kinds of waste places. It is a very variable plant. The leaves are cooked and eaten and the roots are largely used in medicine.

APETALAE

Amarantaceae

Herbs. Leaves opposite or alternate. Bracts and bracteoles scaly or chaffy. Perianth of 5 segments. Stamens 1-5, opposite to the perianth-segments. Filaments of anthers free or united together. Sterile stamens present or not between the stamens. Anthers 1- or 2-celled. Ovary 1-celled. Ovules 1 or more. Fruit small, bladder-like, 1-seeded.

- | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|----------------------|
| 1 | Leaves alternate | ... | ... | ... | ... | ... | 2 |
| | Leaves opposite or clustered | ... | ... | ... | ... | ... | 6 |
| 2 | Sterile stamens present between the stamens | ... | ... | ... | ... | ... | Aerva, p. 239. |
| | Sterile stamens absent | ... | ... | ... | ... | ... | 3 |
| 3 | Ovary containing 2-many ovules | ... | ... | ... | ... | ... | Celosia, p. 240. |
| | Ovary containing 1 ovule only | ... | ... | ... | ... | ... | 4 |
| 4 | Flowers 1-sexual | ... | ... | ... | ... | ... | Amarantus, p. 240. |
| | Flowers 2-sexual | ... | ... | ... | ... | ... | 5 |
| 5 | Flowers arranged in heads | ... | ... | ... | ... | ... | Allmania, p. 241. |
| | Flowers arranged in spikes | ... | ... | ... | ... | ... | Digera, p. 242. |
| 6 | Anthers 2-celled | ... | ... | ... | ... | ... | 7 |
| | Anthers 1-celled | ... | ... | ... | ... | ... | 11 |
| 7 | Flowers in a cluster, 1-3 perfect, surrounded by others | ... | ... | ... | ... | ... | |
| | imperfect, with hooked bristles or awns | ... | ... | ... | ... | ... | Pupalia, p. 243. |
| | Flowers all perfect | ... | ... | ... | ... | ... | 8 |
| 8 | Sterile stamens present between normal stamens | ... | ... | ... | ... | ... | Achyranthes, p. 243. |
| | Sterile stamens absent | ... | ... | ... | ... | ... | 9 |
| 9 | Stamens 2 | ... | ... | ... | ... | ... | Nothosaerva, p. 244. |
| | Stamens 5 | ... | ... | ... | ... | ... | 10 |

- 10 Flowers arranged in spikes in the axils of leaves ... Psilotrichum, p. 244.
 Flower arranged in panicles of spikes at the ends of
 branches Psilostachys, p. 244.
- 11 Staminal tube very short; stigma round Alternanthera, p. 245.
 Staminal tube long; stigma 2-branched Gomphrena, p. 246.

Aerva, Forsk.

Erect or prostrate herbs. Leaves alternate, opposite or whorled. Flowers minute, in simple or paniced spikes. Perianth-segments 5. Stamens 5, united together at their bases and having sterile stamens between them. Ovules single.

- 1 Leaves alternate; perianth-lobes 5 2
 Leaves opposite or whorled; perianth-lobes 4 Monsoniae.
- 2 Spikes in the axils of leaves, less than $\frac{1}{2}$ in. long ... lanata.
 Spikes arranged in panicles in the axils and at the ends
 of branches, 1-6 in. long tomentosa.

Aerva Monsoniae, Mart.

Stems branched from the base and having a long tap-root. Branches numerous, prostrate. Leaves opposite or whorled, not stalked, very narrowly linear, slightly woolly, somewhat spine-pointed, midrib prominent, $\frac{1}{4}$ - $\frac{3}{4}$ in. long. Spikes at the ends of short lateral branches, cylindrical, covered with silky hairs, pale pink, $\frac{1}{2}$ -1 in. long. Perianth-lobes 4, very acute. Fruit ovoid, thinly membranous, enclosed in the staminal cup. Flowers January to March.

Pallavaram, near the hills.

Aerva lanata, Juss.

An erect or postrate herb branched from the base. Branches woolly. Leaves alternate, elliptic, obovate or circular in outline, obtuse, softly hairy above, white with wool beneath, up to 1 in. long. Flowers very small, greenish-white, in dense axillary spikes $\frac{1}{4}$ - $\frac{1}{2}$ in. long. Perianth-segments 5, silky with hairs on the back. Flowers August to January.

A very common weed in gardens and waste places.

Aerva tomentosa, Forsk. (Aerva javanica, Juss.)

An erect shrubby herb covered with white hairs, 2-3 ft. high. Leaves alternate, not stalked, oblong to spatula-shaped or linear-oblong, densely covered with soft hairs, up to

2½ in. long. Flowers male and female on one plant, dull white, in linear or oblong spikes 1-6 in. long, the latter arranged in panicles at the ends of branches. Perianth 5-lobed, silky with hairs on the back. Flowers in September.

On sandy patches near Basin Bridge.

Celosia, Linn.

Annual herbs. Leaves alternate. Flowers in dense or interrupted spikes. Perianth-lobes 5. Stamens 5, united below into a membranous cup. Ovules 2 or more.

Flowers in dense spikes up to 4 in. long *argentina*.

Flowers in small clusters on slender interrupted spikes

about 1 in. long *polygonoides*.

Celosia argentina, Linn.

An erect glabrous annual. Leaves linear, lanceolate or sometimes ovate, acute, entire, glabrous, 1-4 in. long. Flowers at first pinkish, afterwards glistening white, crowded in close, cylindrical spikes 1-6 in. long, at the ends of branches. Perianth about ¼ in. long. Capsule 4- to 8-seeded, breaking open by the upper half coming off as a lid. Flowers December to February.

In rice fields and cultivated ground. This weed is not indigenous but whence it came is not known.

Celosia polygonoides, Retz.

A low herb branching from the base. Branches hairy. Leaves ovate, obtuse at apex, slightly wedge-shaped at base, sparsely hairy on both surfaces, up to 1 in. long. Leaf-stalks up to ¾ in. long. Flowers in clusters of 2 or 3, arranged in spikes at the ends of branches. Capsule flask-shaped, with a thickened head. Flowers in August and after.

On sandy soils.

Celosia cristata, Linn. The Cock's Comb

Frequently grown in gardens.

Amarantus, Linn.

Annual herbs, erect or prostrate. Leaves alternate. Flowers small, 1-sexual, in clusters or panicles. Perianth of 2-5 lobes. Stamens as many as the perianth-lobes. Filaments free. Anthers 2-celled. Ovules single.

1 Spines present in the axils of leaves; perianth-lobes 5 *spinosus*.

Spines absent; perianth-lobes 3 2

2 Leaves ovate or deltoid, up to 3 in. long; leaf-stalks up to 2 in. long *viridis*.

Leaves obovate, wedge-shaped at base, up to 1 in. long; leaf-stalks up to ½ in. long *polygamus*.

Amarantus spinosus, Linn.

முள்ளுருக்கி

Pl. XXIX, A.

ముండ్లచోటకూర

An erect spinous herb. Leaves ovate or lanceolate, obtuse, entire, glabrous, $1\frac{1}{4}$ -3 in. long. Leaf-stalks $\frac{3}{4}$ -2 $\frac{1}{2}$ in. long. Flowers numerous, in spikes in the axils of leaves or at the ends of branches. Perianth-segments 5 in male flowers, bristle-pointed; in female flowers obtuse. Stamens 5. Styles 2. Flowers in the rainy weather.

In all kinds of waste places. The roots are used in Indian medicine.

Amarantus viridis, Linn.

An erect glabrous annual. Branches grooved, often purplish. Leaves ovate or deltoid-ovate, notched at the apex, glabrous, up to 2 in. long. Leaf-stalk up to 2 in. long. Flowers pale green, in small clusters in the axils of leaves or in spike-like racemes at the ends of branches. Sepals 3. Styles 2 or 3. Flowers in the rainy months.

In cultivated ground near villages. The leaves are eaten as a vegetable.

Amarantus polygamus, Linn.

A small prostrate glabrous herb. Leaves obovate, obtuse, notched at apex, base tapering, $\frac{3}{8}$ -1 in. long. Flowers in clusters in the axils of leaves. Perianth-lobes 3, awned at apex. Styles 3. Flowers in the rainy weather.

In waste land near the sea.

Amarantus gangeticus, Linn.

கீரை

చోటకూర

An erect herb with stout stem, normally up to 4 ft. high. Leaves rhomboid-ovate, 2-6 in. long. Cultivated in gardens for the sake of the stems and leaves which are eaten.

Var. *tristis*

An annual herb with many prostrate branches arising from near the base of the stem. Very commonly cultivated for its leaves which are eaten as "spinach."

Amarantus caudatus, Linn. Love-lies-bleeding

Grown in gardens of European residents.

Allmania, R.Br.

Erect or spreading herbs. Leaves alternate, entire. Flowers collected in globose or oblong heads. Perianth of 5 lobes. Filaments united at the base. Ovary ovoid, narrowed to a straight style. Stigma 2-lobed. Ovules single, erect.

Flower-heads not stalked, brown *nodiflora*.

Flower-heads stalked, white *longepedunculata*.

Allmania nodiflora, R.Br.

A loosely-spreading many-branched herb with a stout root portion. Branches roughly hairy. Leaves circular or spatula-shaped, entire, wedge-shaped at base, with a sharp point at the obtuse apex, densely hairy on both surfaces, 1 in. or more long. Flower-heads not supported on stalks, brown, $\frac{1}{2}$ - $\frac{3}{4}$ in. in diameter. Flowers in December.

On bunds of rice fields at Avadi.

Var. *procumbens*, Hook.

Stems prostrate, practically glabrous. Leaves obovate, wedge-shaped at base, with a sharp point at apex, glabrous, up to 1 in. long. Leaf-stalk about $\frac{1}{2}$ in. long. Flower-heads practically without stalks, $\frac{1}{4}$ in. in diameter. Flowers in November.

Ennur, spreading on sand.

Var. *angustifolia*, Hook.

An erect branched herb. Stems glabrous. Leaves linear, glabrous, not stalked, acute at apex, up to 3 in. long. Heads not stalked, brown, $\frac{1}{3}$ in. in diameter. Flowers in November.

Vandalur, in fields. Near Guindy, along railway line.

Allmania longepedunculata, Gamble. (*Allmania albida*, R.Br.)

An erect annual herb. Younger parts covered with rough hairs. Leaves linear, acute at apex, hairy on both surfaces, up to 4 in. long. Flower-heads often ovate or cylindrical, carried on slender-stalks of varying lengths, white, $\frac{1}{2}$ - $\frac{3}{4}$ in. in diameter. Anthers reddish. Flowers in January.

Adyar.

This is a difficult genus as the species vary a great deal. It is desirable that local botanists should take up its further study.

Digera, Forsk.

Annual herbs. Leaves alternate, entire, stalked. Flowers arranged in spikes in the axils of leaves. Perianth-segments 5, the 2 outer larger than the others. Stamens 5. Filaments free. Seeds single.

Digera arvensis, Forsk.

A slender glabrous herb with prostrate branches. Leaves ovate or elliptic, acute at apex, glabrous, up to 3 in. long. Leaf-stalk 1 in. long. Spikes 1-5 in. long. Perianth rose-coloured. Flowers in October and November.

In waste places.

Pupalia, Juss.

Herbs or shrubby herbs. Leaves opposite, stalked. Flowers green, arranged in clusters forming spikes. Only 1 or 2 flowers of each cluster perfect. Bracts and bracteoles awned. Imperfect flowers reduced to hooked bristles. Perianth of perfect flowers 3- to 5-lobed. Stamens 5, combined near the base. Seeds single.

Leaves ovate or elliptic; hooked bristles yellow lappacea.

Leaves circular or obovate; hooked bristles brown orbiculata.

Pupalia lappacea, Moq.

A large straggling shrubby herb. Leaves elliptic or ovate, acute or obtuse, often drawn out at apex, minutely hairy on both surfaces, $1\frac{1}{4}$ -4 in. long. Flowers in clusters forming spikes at the ends of branches. Spikes 4-10 in. long. Hooked awns spreading like a star, yellow. Perianth-lobes 3-nerved, densely clothed with white wool. Flowers November to January.

In hedges at Teynampet and Adyar.

Puppalia orbiculata, Wt.

An extensively spreading prostrate plant. Stem shortly hairy. Leaves thick, circular or obovate, obtuse, with a very minute point at apex, suddenly tapering to the stalk, densely covered with short hairs on both surfaces, $\frac{3}{4}$ - $1\frac{1}{4}$ in. in diameter. Spikes 6-12 in. long. Hooked awns glabrous, pale brown in fruit, spreading. Perianth-lobes 3-nerved, clothed with white wool. Flowers in November and December.

Spreading on the sands near the sea. It is one of the sand-binding plants of the coast. Abundant at Ennur.

Achyranthes, Linn.

Herbs. Leaves opposite. Flowers in slender spikes, soon deflexed. Bracts and bracteoles spine-tipped. Perianth of 4 or 5 rigid segments. Stamens 2-5, united at the base and having sterile stamens between them. Ovules single.

Achyranthes aspera, Linn.

நாயுருவி Pl. XXIX, B. கத்தரிக்காய்

An erect herb reaching 3 ft. high. Branches minutely hairy. Leaves obovate or elliptic, obtuse, entire, softly hairy on both surfaces, up to 4 in. long. Leaf-stalks $\frac{1}{4}$ - $\frac{3}{4}$ in. long. Flowers numerous, greenish-white, completely deflexed, in spikes becoming 20 in. long when mature, at the ends of branches. Perianth glabrous and shiny. Stamens 5; sterile stamens fringed at the top. Flowers during the rainy season.

A very common weed of waste places.

The fruit separate from the plant and adhere to the fur of animals or to clothing with the help of the spiny bracteoles.

Nothosaerva, Wt.

An annual herb with opposite, spreading branches. Leaves opposite. Flowers very minute, wooly, in clustered spikes in the axils of leaves and at the ends of branches. Perianth of 3-5 lobes. Stamens usually 2, free. Ovules single.

Nothosaerva brachiata, Wt.

Pl. XXIX, C.

An erect slender branching herb. Stem sparsely hairy. Leaves elliptic or lanceolate, acute or slightly obtuse, narrowed at base, very minutely hairy, $\frac{3}{4}$ -1 $\frac{1}{2}$ in. long. Spikes cylindrical, white, standing singly or in clusters, up to $\frac{1}{2}$ in. long. Flowers November to December.

Borders of rice fields and ponds.

Psilotrichum, Blume

Herbs or shrubby herbs. Leaves opposite, entire, stalked. Flowers white or greenish, in spikes or clusters. Perianth of 5 segments. Stamens 5. Filaments united for a short distance at the base. Ovules single.

Psilotrichum calceolatum, Moq.

A somewhat erect herb with many branches arising from the base. Branches densely covered with short hairs. Leaves ovate-lanceolate or elliptic, acute, sparsely hairy, carried on short stalks, $\frac{1}{2}$ -1 $\frac{1}{2}$ in. long. Spikes 4- to 6-flowered, on short stalks in the axils of leaves. Sepals hairy. Flowers in December and January.

Occasional on roadsides. Nungambakam.

Psilostachys, Hochst.

Slender, dichotomously branching herbs. Leaves opposite, stalked. Flowers minute, in slender spikes at the ends of the branches of a loose panicle. Perianth with 5 segments, the 3 or 2 outer lobes strongly 3-nerved and broader than the inner. Stamens 5, free. Ovules single.

Psilostachys sericea, Hook.

A very pretty slender erect silky herb. Leaves broadly ovate, acute, sparsely silky, hairy above, densely so beneath, up to 1 in. long. Flowers in 3-branched cymes, arranged in loose spikes near the top of the cyme-branches.

Included on the authority of Mr. Fischer.

Alternanthera, Forsk.

Prostrate herbs. Leaves opposite. Flowers small, in heads in the axils of leaves. Perianth-segments 5, unequal. Stamens 2-5. Filaments short, united together into a short cup. Anthers 1-celled. Ovules single.

Leaves lanceolate, oblanceolate or linear-oblong, 2 in. long or more; perianth-segments acute, not spine-tipped; stamens 3 ... triandra.

Leaves more or less circular in outline, under 1 in. in diameter; perianth-segments spine-tipped; stamens 5 echinata.

Alternanthera triandra, Lamk. (*Alternanthera sessilis*, R.Br.)

பொன்னுங்கண்ணி

Pl. XXIX, D.

சாஷு கொடி

A prostrate herb often rooting at the nodes. Stems glabrous. Leaves obtuse or acute, sometimes obscurely toothed, glabrous, up to 2 in. long (in wet places slightly larger). Flowers white, shiny, not stalked, in small heads in the axils of leaves. Perianth-segments ovate, 1-nerved, acute. Stamens 3. Flowers August to January.

In damp places as on the borders of ponds, tanks and rice fields. The leaves are cooked and eaten.

Alternanthera echinata, Sm.

A prostrate spreading herb not rooting at the nodes. Stems zig-zag, covered with shaggy hairs. Leaves roughly circular, the two halves unequal, obtuse, entire, narrowed at the base, having 4 pairs of nerves, covered with a layer of very short silky hairs which are longer on the young leaves, $\frac{1}{2}$ -1 in. in diameter. Flowers not stalked, in heads in the axils of leaves. Bractioles 2. Perianth-segments 1-nerved, scaly; the outer 3 larger than the inner 2; the posterior one oblong, obtuse and furnished with a sharp point at apex; the 2 lateral ones lanceolate, sharply pointed at apex and becoming spiny in fruit; the 2 inner ones fringed with hairs. Stamens 5, minute.

Flowers August to January.

On the banks of the canal, near Basin Bridge. People's Park. Kodambakam, between the railway station and the Loyola College. This is a native of Tropical America. I first noticed this weed near Kodambakam in December, 1924. In October, 1925 I found it growing along the banks of the canal near Basin Bridge and in March, 1926, I found it in the People's Park. It grows on the railway line opposite to the King's Institute, Guindy (1928). It is fairly well established in these places and in a few years may be expected to spread throughout the city as it has done at Bangalore and Coimbatore.

Telanthera ficoidea, Moq.

A plant with small leaves of a crimson colour commonly used in gardens for edging. A native of Brazil. It is often known as *Alternanthera amabilis*. It is propagated by cuttings.

Gomphrena, Linn.

Erect or prostrate herbs. Stems covered with soft woolly hairs. Nodes swollen. Leaves opposite. Flowers arranged in heads. Calyx-segments 5, more or less unequal. Stamens 5. Anthers 1-celled. Filaments united into an elongate tube. Fruit ovoid, compressed, 1-seeded.

Stem erect; flower-heads round *globosa*.

Stems spreading on the ground; flower-heads cylindrical ... *decumbens*.

Gomphrena globosa, Linn. Globe Amaranthus

வாடாமல்லிகை

An erect branching annual. Stems covered with white hairs. Leaves elliptic-oblong, acute or obtuse, hairy on both surfaces, on much-reduced stalks, up to 3 in. long. Flower-heads large, purple or white. Flowers after the rains.

Probably a native of America. It is common in cultivation and may occasionally be found as an escape.

Gomphrena decumbens, Jacq.

Pl. XXIX, E.

A low spreading herb with the branches tending to stand erect especially when young. Stems many, arising from the thickened upper root portion, covered with white shaggy hairs. Nodes swollen. Leaves spatula-shaped or oblong-elliptical, often with a small sharp point at apex, wedge-shaped at base, almost glabrous above, covered with long white shaggy hairs beneath, dotted with minute glands on the lower surface, often decurrent on the short stalk, up to $2\frac{1}{2}$ in. long. Flowers in dense cylindrical spikes usually about 1 in. long but in older specimens up to 3 in. long, at the ends of branches. Flowers enclosed in a silvery bract and a pair of bracteoles. Perianth-segments covered with dense white wool; the 2 inner lateral segments larger, concave, woolly, perfectly green along the middle; the three outer ones transparent, scale-like, woolly at base only. Staminal tube long. Anthers yellow. Style short. Stigma 2-lobed. Seeds brown, falling away from the fruit on ripening. Flowers all through the year.

Almost the commonest weed in Madras. It is a native of Central America and the West Indies and has within recent years overrun the whole of the city and suburbs. It is found on roadsides and cultivated ground and in gardens and is becoming troublesome on lawns. It has advanced as far as Vandalur on the south and the Red Hills on the north.

Chenopodiaceae

Chiefly succulent herbs, occasionally shrubs, with alternate leaves and minute green flowers. (In *Haloxylon* leaves are opposite.) Perianth-segments 3-5, imbricate in bud. Stamens as many as the perianth-segments and opposite to them. Ovary 1-celled, becoming, when mature, a small bladderly 1-seeded fruit. Styles or stigmatic branches 2 or 3.

- | | | |
|---|---|--------------------------|
| 1 | Stem twining | Basella, p. 247. |
| | Stem not twining | 2 |
| 2 | Leaves absent; stems jointed | 3 |
| | Leaves present; stems not jointed (except in <i>Haloxylon</i>)... | 4 |
| 3 | Flowers in the scales of cone-like spikes | Arthrocnemum,
p. 248. |
| | Flowers sunk in cavities in successive thickened upper joints, forming a spike | Salicornia, p. 248. |
| 4 | Branches jointed; shrubby plants; perianth-segments transversely winged | Haloxylon, p. 248. |
| | Branches not jointed; herbaceous plants; perianth-segments not transversely winged | 5 |
| 5 | Leaves linear, quite fleshy | Suaeda, p. 249. |
| | Leaves broad, not fleshy to any marked degree | 6 |
| 6 | Plants growing only in saline soils; flowers 1-sexual | Atriplex, p. 249. |
| | Plants not growing in saline soils; flowers 2-sexual | Chenopodium,
p. 250. |

Basella, Linn.

Fleshy twining much-branched glabrous herbs. Leaves alternate, broad, entire. Flowers 2-sexual, arranged in spikes. Bracteoles 2. Perianth with 5 short lobes. Styles 3. Fruit enclosed in the fleshy perianth.

Basella rubra, Linn.

பச்சளம் உப்பு

A perennial glabrous succulent climbing herb. Leaves broadly ovate, acute or drawn out at apex, entire, base often cordate, 2-5 in. long. Leaf-stalks $\frac{1}{2}$ -1 in. long. Flowers white or red, not stalked, arranged on spikes 1-6 in. long. Fruit of the size of a pea, red, white or black. Flowers in the hot weather.

Found growing in hedges and frequently cultivated. The leaves are eaten as a pot-herb. The form met with in Madras is the white-flowered variety.

Arthrocnemum, Moq.

Fleshy leafless herbs with jointed stems, profusely branching. Flowers minute, 2-sexual, 2-3 together in the axils of scaly bracts forming sessile, cone-like spikes. Stamens single. Stigmas 2. Fruit enclosed in the swollen perianth.

Arthrocnemum indicum, Moq.

பவளப்பூண்டு

Pl. XXX, A.

A perennial shrubby herb covered with a white bloom. Stems prostrate. Branches numerous, with a woody core, jointed, very fleshy; the segments short, thick, truncate, dilated and usually 2-toothed at the top. Flowers in cylindrical, blunt spikes $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Flowers in January.

Salt marshes at Ennur and Covelong.

Salicornia, Linn.

Low herbs of salt marshes with fleshy leafless jointed stems. Flowers minute, 3 together in the hollows of the upper joints, forming cylindrical spikes. Bracteoles 2. Perianth greenish. Stamens single. Ovary ovoid. Stigmas 2. Fruit thin, enclosed by the spongy perianth.

Salicornia brachiata, Roxb.

உமரிக்கீரை

A much-branched erect herb, the branches arranged oppositely. Segments of branches slightly dilated and 2-toothed at top. Flowers arranged in slender cylindrical spikes 1-3 in. long. Fruit thin, ovoid. Seed pale brown, covered with stiff white hairs. Flowers in the rainy months.

Near the salt-pans at Covelong. This species does not occur in the salt-pan area at Ennur.

Haloxylon, Bunge.

Shrubs with opposite jointed branches. Leaves opposite. Flowers 2-sexual, 1-3 together, arranged in spikes in the axils of ovate bracts. Bracteoles 2. Perianth 5-lobed; the lobes horizontally winged on the back. Stamens 5 or fewer. Stigma 2-lobed or 3 or 4 stigmas, recurved. Fruit enclosed in the perianth.

Haloxylon recurvum, Bunge.

A bushy plant reaching to 3-4 ft. in height. Leaves small, ovate, very fleshy, glabrous, $\frac{1}{8}$ - $\frac{1}{3}$ in. long. Flowers arranged in spikes 1-6 in. long in the axils of leaves. Perianth-segments somewhat fleshy, furnished with a thin wing at the middle of the back of each segment.

I have not collected this species in our area and have included it at the suggestion of Mr. Fischer who says that it may be expected to occur along backwaters.

Suaeda, Forsk.

Herbs growing in saline soil. Leaves very thick and fleshy. Flowers minute. Perianth 5-lobed. Stamens 5. Style absent. Stigmas 2-5.

1	Spikes leafless along the upper part	...	...	...	...	nudiflora.
	Spikes leafy throughout	...	...	...	...	2
2	Stigmas 3	...	...	...	...	monoica.
	Stigmas 2	...	...	...	...	maritima.

Suaeda nudiflora, Moq.

A woody much-branched herb. Leaves semi-cylindrical, $\frac{1}{2}$ in. long. Flowers arranged in dense, globose, many-flowered clusters forming long spikes, leafless above, bisexual. Stigmas 3. Flowers July to April.

Banks of the Coom and the Buckingham Canal. Salt marshes at Ennur.

Suaeda monoica, Forsk.

A small erect bush often more than 3 ft. high. Branches marked with prominent leaf-scars. Leaves arranged somewhat close together, up to $\frac{1}{2}$ in. long. Flowers 2 or 3 together in the axils of leaves, some 1-sexual, others 2-sexual. Bracteoles entire. Perianth yellowish-green, fleshy. Styles usually 3. Flowers August to January.

On the banks of the Coom and the Buckingham Canal.

Suaeda maritima, Dumort.

Pl. XXX, B.

An erect slender annual herb about 2 ft. high. Branches numerous, very slender. Leaves up to 1 in. long. Bracteoles thin, entire. Flowers 2-sexual, in small, few-flowered clusters in the axils of shorter leaves. Stigmas 2. Flowers in April and May.

Near the salt-pans at Ennur, often in association with *Suaeda nudiflora*.

In each of the three species described above we find two varieties growing side by side, the normal one with green leaves and the red variety with red branches and leaves.

Atriplex, Linn.

Herbs covered with minute whitish scales (mealy). Leaves alternate. Flowers small, 1-sexual. Male flowers with 3- to 5-partite perianth. Female flowers having no perianth. Stigmas 2. Fruit enclosed in the enlarged bracteoles.

Atriplex repens, Roth

A prostrate herb with long white trailing branches rooting at the nodes. Leaves ovate-circular, entire, obtuse at apex, carried on short stalks, completely covered with minute white shiny scales, about $\frac{3}{4}$ in. long. Male flowers in short, branched spikes. Bracts supporting female flowers united into a roundish pouch and becoming thick with warty protuberances in fruit. Flowers in September.

On land bordering the salt marshes at Ennur.

Chenopodium, Linn.

Erect or prostrate herbs. Stem angled. Leaves usually lobed or toothed. Flowers minute, 2-sexual, arranged in clusters in the axils of leaves. Perianth usually 5-lobed. Stigmas 2-5.

Chenopodium murale, Linn.

Pl. XXX, C.

An erect foetid herb 1-2 ft. high. Stem green, often lined with red. Leaves rather thick, rhomboid or deltoid-ovate, very unequally and acutely toothed, base wedge-shaped, $1\frac{1}{2}$ - $3\frac{1}{2}$ in. long. Leaf-stalk nearly as long as the blade. Flowers in dense clusters of spikes in the axils of leaves, green. Stamens 5, opposite to the perianth-lobes. Styles 2. Seed roundish. Flowers December to March.

An occasional weed near villages. It is believed to be an introduced weed. This species does not seem to have been previously collected on the East Coast as the locality recorded in Gamble's Flora is "Deccan, in Mysore and Coimbatore."

Phytolaccaceae

Herbs or shrubby herbs. Leaves alternate, having no stipules. Flowers arranged in racemes. Perianth of 4 or 5 segments, imbricate, coloured like petals. Stamens 4 or 5, alternating with the perianth-segments or numerous. Ovary of one carpel or more, superior. Ovules single. Fruit fleshy or dry.

Fruit globose	...	...	...	...	...	...	...	...	Rivinia.
Fruit elongated	...	...	...	...	...	...	...	...	Petiveria.

Rivinia, Linn.

Erect herbs. Leaves alternate, more or less opposite. Flowers arranged in racemes in the axils of leaves. Bracts and bracteoles minute, soon falling. Perianth coloured, having 4 segments. Stamens 4. Ovary of one carpel.

Rivinia humilis, Linn. (*Rivinia laevis*, Linn.) Blood Berry

Pl. XXX, D.

An erect glabrous herb 2-3 ft. high. Leaves ovate, acuminate, margin entire or slightly wavy, glabrous, thin, 2-5 in. long. Flower-stalks white, $\frac{1}{10}$ in. long. Perianth-segments white, $\frac{1}{12}$ in. long. Ovary 10-celled. Ovules single. Berry scarlet, supported by the perianth-segments which become green as they mature, $\frac{1}{8}$ in. in diameter. Flowers August to November.

Agri-Horticultural Society's Garden. Mylapore, in compounds. Nungambakam. It is a native of tropical and sub-tropical America introduced as a garden plant. It has run wild and become naturalized.

Petiveria, Linn.

Deeply rooting herbs with odour of garlic. Leaves alternate, entire. Stipules minute. Flowers arranged in spikes in the axils of leaves or at the ends of branches. Perianth-segments 4. Stamens 4-8. Ovary of one carpel, with 4 downward-pointing hook-like processes at the top. Style absent. Fruit with 4 small lobes at the top each having a downward pointing hook.

Petiveria alliacea, Linn.

An erect herb 1-3 ft. high having a strong garlic smell. Leaves elliptical, $2\frac{1}{2}$ -6 in. long. Perianth-segments white, $\frac{1}{6}$ in. long. Fruit $\frac{1}{3}$ - $\frac{1}{2}$ in. long. Flowers September to December.

Agri-Horticultural Society's Garden. A native of the West Indies and warmer parts of America. It has established itself in Madras gardens for years but has not spread outside.

Polygonaceae

Herbs, rarely shrubs. Stems swollen at the nodes. Leaves alternate. Stipules, when present, sheathing the stem, scale-like or very thin. Perianth of 3-6 segments, sometimes coloured. Stamens 5-8, opposite the perianth-segments. Ovary 1-celled with one ovule. Styles 3 or 2. Fruit a small, hard, 3-angled or biconvex nut enclosed in the perianth.

Stem erect or prostrate	...	...	...	...	...	...	Polygonum.
Stem climbing	...	...	...	...	...	...	Antigonon.

Polygonum, Linn.

Herbs or shrubs. Stipules very thin, forming a sort of tube round the stem. Flowers small, in clusters, spikes or racemes. Perianth of 5 segments, often coloured.

Polygonum plebejum, R.Br.

Pl. XXX, E.

A small prostrate herb with many branches starting from the base of the stem. Leaves obovate, $\frac{1}{4}$ in. long. Stipules transparent, short. Flowers pink, standing singly or 2 or 3 together. Appears after the rains and continues till August.

Common on the borders of tanks and ponds.

Antigonon, Endl.

Climbing shrubs. Leaves alternate. Stipules scale-like or reduced to a line. Flowers in copious racemes in the axils of leaves or at the ends of branches. Peduncle ending in a branched tendril. Perianth-segments 5, coloured, the 3 outer ones larger, enlarging in fruit. Stamens 8, united into a tube. Tooth-like staminodes present between the stamens. Styles 3.

Antigonon leptopus, Hook. & Arn. Railway Creeper

Leaves ovate, channelled with a net-work of veins, 6 in. long. Flowers showy, pink or white. A native of South America. A common garden creeper. Occasionally found run wild.

Aristolochiaceae

Herbs or shrubs, usually foetid. Perianth often red or brown, coherent with the 4- to 6-celled ovary; perianth-lobes meeting by their edges. Stamens 6 or more, adherent to the top of the ovary or round the style. Fruit usually a capsule with numerous seeds.

Aristolochia, Linn.

Erect or twining herbs or shrubs with alternate leaves and greenish (or lurid purple) flowers in the axils of leaves. Perianth tubular, the tube inflated below, then contracted. Anthers without filaments, wholly adherent to the short style. Ovary inferior, 6-celled. Capsule splitting along the partition walls of the cells.

Stem prostrate; leaves covered with a whitish bloom on the under surface; bracts large and round bracteata.

Stem twining; leaves greenish beneath; bracts small, ovate ... indica.

Aristolochia bracteata, Retz.

ஆடுதீண்டாப்பாலை

ಗಾಡಿಹುಳು

A slender prostrate herb about 1 foot long. Leaves broadly ovate, cordate at base, the clefts much widened, $1\frac{1}{2}$ -3 in. long and nearly as broad. Leaf-stalks about $\frac{3}{4}$ in. long. Flowers standing singly, with a large circular bract. Perianth over 1 in. long; base globular; tube cylindrical; mouth trumpet-shaped; lip dark purple and as long as the tube. Capsule oblong-ellipsoid, 12-ribbed, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Flowers in November and December.

An occasional weed much used in medicine.

Aristolochia indica, Linn.

ஈசுவரமூலி

Pl. XXXII, A.

கங்குலம்

A twining shrub. Leaves very variable, in the local form oblong, glabrous, 3-6 in. long. Perianth greenish-white, up to $1\frac{3}{4}$ in. in length, with globose inflated base, then bent at right angles, then suddenly narrowed into a cylindrical tube, with oblique, trumpet-shaped mouth gradually passing into a narrow brownish lip. Capsule $1\frac{1}{2}$ -2 in. long, oblong, opening from below upwards along the 6 lines of partition. Fruit-bearing stalks also splitting into six slender thread-like parts. Seeds winged. Flowers in October and November.

Common in Guindy Park, Adyar, Avadi, Pallavaram and Vandalur, climbing over bushes. The plant is very bitter and is said to be an antidote for snake-bite.

Piperaceae

Herbs or shrubs, often with swollen nodes. Leaves entire. Flowers minute, arranged in spikes. Perianth absent. Stamens 2-6. Ovary 1-celled. Ovules single.

Peperomia, Ruiz and Pav.

Succulent herbs. Leaves opposite, dotted with oil-glands. Flowers minute. Bracts and bracteoles present. Stamens 2. Berry minute.

Peperomia pellucida, H.B. & K.

Pl. XXX, F.

A slender much-branched annual herb. Stems spreading on the ground with their upper parts tending to stand erect. Leaves some opposite, others alternate, broadly ovate-deltoid, acute, cordate, very thin, 5- to 7-ribbed from the base, about 1 in. in diameter. Spikes very slender, opposite the leaves, 1-2 in. long. Flowers in the rainy months.

A native of South America. A garden weed found in damp shady places.

Piper Betle, Linn. The Betel-leaf Plant

வெற்றிலைக்கொடி

శమలపాకు తీగ

A perennial climber cultivated in betel-gardens for its leaves which are chewed by most Indians mixed with chunam and areca nut. The plants are supported on quick-growing trees chiefly *Sesbania grandiflora*.

Lauraceae

Aromatic trees or shrubs or leafless parasitic climbers. Leaves alternate. Flowers 1-sexual or 2-sexual, in clusters or in umbels in the axils of leaves. Perianth consisting

of 6 lobes arranged in 2 imbricating series. Stamens disposed on the perianth-tube, in 2 or 4 series, in multiples of 3. Ovary free from the perianth-tube, 1-celled, 1-ovuled. Fruit a berry or a drupe.

Leafless twining parasites	...	...	...	...	...	...	Cassytha.
Trees or shrubs with fairly large leaves	...	...	...	...	...	...	Litsaea.

Cassytha, Linn.

Thread-like leafless twining parasites. Flowers small, with 6 segments to the perianth, the 3 outer smaller. Stamens in 4 rows; perfect stamens 9 or 6, the rest sterile. Fruit a small drupe, enclosed in the succulent perianth-tube and crowned by the perianth-limb.

Cassytha filiformis, Linn.

Pl. XXIX, F.

Stems very long, cord-like, twined and matted together, branched, dark green. Flowers small, arranged in spikes $\frac{1}{2}$ -2 in. long. Fruit white, globose, smooth, $\frac{1}{4}$ in. in diameter. Flowers September to April.

Very common. Growing on shrubs in Guindy Park, Avadi, Pallavaram and Vandalur.

Litsaea, Lamk.

Evergreen trees or shrubs. Leaves alternate. Flowers, male and female on different plants, in 4- to 6-flowered umbels in the axis of leaves. Limbs of perianth 6 or 4 or sometimes absent. Stamens 9-20 in male flowers; an undeveloped ovary also present. In female flowers ovary enclosed in the perianth-tube or free; sterile stamens up to 12 present. Fruit a drupe or a berry.

Litsaea chinensis, Lamk. (Litsaea sebifera, Pers.)

A small tree. Ends of branchlets, flower-stalks and under surface of leaves more or less downy. Leaves elliptic-oblong, rounded or obtuse at apex, acute at base, entire, glabrous above excepting on the midrib, under surface grey, softly hairy on the midrib, nerves 8-10 pairs, 4-6 in. long. Petioles $\frac{1}{2}$ -1 $\frac{1}{4}$ in. long. Flowers yellowish, $\frac{1}{4}$ in. in diameter before expansion, in few-flowered umbels. Perianth not lobed. Stamens about 20. Fruit globose, $\frac{1}{4}$ in. in diameter, purple when ripe. Flowers in January and February.

Adyar, in jungly places. Mr. Fischer in his Forest Flora of East Central Madras does not make mention of this plant. The locality given for this species in Gamble's Flora is N. Circars from Ganjam to the Godavari, in hill forests; Deccan, in the hills of Nellore and Cuddapah.

Proteaceae

Trees or shrubs. Leaves alternate, pinnately cut. Perianth-lobes 4. Stamens 4, opposite to the perianth-lobes. Ovary 1-celled. Seeds single or few.

No member of this family is wild within our area. Only one species *Grevillea robusta*, the Silver Oak, is sometimes planted in Madras gardens. A moderate-sized handsome tree from Australia, common in Tea Estates on the Nilgiris.

Loranthaceae

பல்லுருவி

I have not collected any member of this family in our area. They are common on trees in hilly country and are found on the Kambakkam Hills, Chengleput district.

Thymeleaceae

Shrubs or small trees. Leaves alternate or opposite. Flowers clustered in the axils of leaves or at the ends of branches. Perianth tubular or bell-shaped, often coloured, frequently with a ring of scales or hairs at the mouth; lobes 4 or 5, imbricate. Stamens as many or twice as many as the perianth-lobes, adherent to the perianth-tube. Ovary superior, 1-celled, 1-ovuled. Fruit a small berry or a drupe.

Wickstroemia, Endl.

Trees or shrubs. Leaves opposite. Flowers in racemes or spikes at the ends of branches. Bracts absent. Perianth-tube elongate; lobes 4, spreading. Stamens 8, in 2 series. Style short. Stigma globose.

Wickstroemia viridiflora, Meissn. (*Wickstroemia indica*, C. A. Mey var. *viridiflora*)

A low shrub. Leaves opposite, obovate-oblong, tip rounded, base wedge-shaped, closely set, glabrous, nerves numerous, $\frac{3}{4}$ - $1\frac{1}{4}$ in. long. Flowers in small clusters at the ends of branches. Perianth greenish-yellow, under $\frac{1}{3}$ in. long. Stamens 8, in 2 rows. Style absent. Fruit when mature scarlet, $\frac{1}{4}$ in. in diameter. Flowers September to January.

Abundant in Guindy Park and neighbourhood. This is a native of Burma and Malaya which has been introduced for cultivation and has become wild.

Santalaceae

Trees or shrubs. Roots parasitic on the roots of other plants. Leaves opposite. Flowers small, arranged in cymes. Stamens opposite to the perianth-lobes. Ovary inferior, 1-celled. Ovules 2-3. Fruit a 1-seeded drupe.

Santalum, Linn.

Trees. Flowers in cymes at the ends of branches. Limbs of perianth 4, meeting by their edges. Ovary at first free, ultimately becoming inferior.

Santalum album, Linn. The Sandalwood Tree

சந்தனம் Pl. XXXII, B. శ్రీగంధపు చెట్టు

A small evergreen tree with slender drooping branches. The sapwood white and not scented, the heartwood yellowish-brown, strongly scented. Leaves elliptic-lanceolate, entire, glabrous, tough, $1\frac{1}{2}$ -3 in. long. Flowers brownish-purple, not scented, arranged in cymose panicles in the axils of leaves and at the ends of branches. Fruit a roundish, purple-black drupe, about $\frac{1}{2}$ in. long. Flowers October to January.

Guindy Park. Pallavaram. Along the Cooum at Chetpat. Often planted in gardens.

The dark central wood of the tree yields the well-known sandalwood oil on distillation. The paste obtained by rubbing the wood on a slab of stone with water is used by Hindus in worship and also for caste-marks and painting the body. The wood is largely used for carving. Chips of the wood are burnt as an incense.

Euphorbiaceae

Plants usually having milky juice. Flowers unisexual, the male and female flowers being on the same plant or on different plants. Perianth-whorls single, occasionally two. Ovary as a rule 3-celled, cells 1- or 2-ovuled. Fruit generally a 3-lobed capsule. The genus *Euphorbia* has very small flowers within a calyx-like involucre, the entire inflorescence being liable to be mistaken for a single flower.

1	Flowers composite ...	...	...	...	...	...	2
	Flowers distinct ...	...	...	...	...	...	3
2	Involucre symmetrical ...	...	...	...	...	...	<i>Euphorbia</i> , p. 258.
	Involucre irregular ...	...	...	...	...	...	<i>Pedilanthus</i> (cultivated), p. 262.
3	Ovary 1-celled ...	...	...	...	...	...	<i>Hemicyclia</i> , p. 262.
	Ovary 3-celled ...	...	...	...	...	...	4
4	Ovules 2 in each cell of ovary ...	...	...	...	...	...	5
	Ovules 1 in each cell of ovary ...	...	...	...	...	...	12
5	Perianth of 2 whorls, an inner and an outer ...	...	...	...	...	...	<i>Cleistanthus</i> , p. 262.
	Perianth of a single whorl ...	...	...	...	...	...	6
6	Rudimentary pistil present in male flowers ...	...	...	...	...	...	<i>Fluggea</i> , p. 263.
	Rudimentary pistil absent from male flowers ...	...	...	...	...	...	7
7	Fruit a dry capsule ...	...	...	...	...	...	8
	Fruit a berry ...	...	...	...	...	...	9

- | | | | | | | |
|----|---|-----|-----|-----|-----|--------------------------------|
| 8 | Perianth-lobes 6 in both male and female flowers; style arising from a depression on the top of the ovary | ... | ... | ... | ... | Agyneia, p. 263. |
| | Perianth-lobes 5 in both male and female flowers; style arising from the apex of the ovary | ... | ... | ... | ... | Phyllanthus, p. 263. |
| 9 | Stamens 5 | ... | ... | ... | ... | Kirganelia, p. 264. |
| | Stamens less than 5 | ... | ... | ... | ... | 10 |
| 10 | Stamens 4 | ... | ... | ... | ... | Cicca (cultivated), p. 265. |
| | Stamens 3 | ... | ... | ... | ... | 11 |
| 11 | Fruit about 1 in. across; leaves $\frac{1}{8}$ in. long | ... | ... | ... | ... | Emblica, p. 265. |
| | Fruit $\frac{1}{3}$ in. across; leaves $\frac{1}{2}$ in. long and over | ... | ... | ... | ... | Breynia, p. 265. |
| 12 | An inner whorl of perianth present at least in the male flowers | ... | ... | ... | ... | 13 |
| | Perianth of a single whorl in both male and female flowers | ... | ... | ... | ... | 17 |
| 13 | Inner whorl of perianth united | ... | ... | ... | ... | Givotia, p. 265. |
| | Inner whorl of perianth free | ... | ... | ... | ... | 14 |
| 14 | Leaves palmately lobed | ... | ... | ... | ... | Jatropha, p. 266. |
| | Leaves not palmately lobed | ... | ... | ... | ... | 15 |
| 15 | Annual herbs | ... | ... | ... | ... | Chrozophora, p. 266. |
| | Shrubs or large trees | ... | ... | ... | ... | 16 |
| 16 | Stamens erect in bud; leaves usually variegated | ... | ... | ... | ... | Codiaeum (cultivated), p. 267. |
| | Stamens bent down in bud; leaves not variegated | ... | ... | ... | ... | Croton, p. 267. |
| 17 | Calyx of male flowers closed in bud | ... | ... | ... | ... | 18 |
| | Calyx of male flowers open in bud | ... | ... | ... | ... | 22 |
| 18 | Styles united into a column, spreading above; twining herbs | ... | ... | ... | ... | Tragia, p. 268. |
| | Styles distinct; not twiners | ... | ... | ... | ... | 19 |
| 19 | Filaments branching; leaves peltate | ... | ... | ... | ... | Ricinus, p. 268. |
| | Filaments branching; leaves attached to their stalks at their bases | ... | ... | ... | ... | 20 |
| 20 | Stamens over 20 | ... | ... | ... | ... | Gelonium, p. 269. |
| | Stamens less than 10 | ... | ... | ... | ... | 21 |
| 21 | Styles long | ... | ... | ... | ... | Acalypha, p. 269. |
| | Styles short | ... | ... | ... | ... | Micrococca, p. 270. |
| 22 | Tree or shrubs | ... | ... | ... | ... | Excaecaria, p. 270. |
| | Herbs | ... | ... | ... | ... | Sebastiana, p. 271. |

Euphorbia, Linn.

Plants with milky juice. Stems slender and leafy or thick and fleshy, sometimes leafless or nearly so. Flowers minute, enclosed in a 4- or 5-lobed involucre resembling a perianth. A thick gland often present between the lobes of involucre and often bearing a petal-like limb. Male flowers numerous, consisting of a single stamen. Filaments jointed. Female flowers single, protruding from the middle of the involucre and consisting of a 3-lobed and 3-celled ovary surmounted by a 2- to 3-cleft style. Capsule separating into three 1-seeded parts.

- | | | | | | | |
|----|--|-----|-----|-----|-----|------------------------------------|
| 1 | Upper leaves red or tinged with red | ... | ... | ... | ... | 2 |
| | Upper leaves green | ... | ... | ... | ... | 3 |
| 2 | Bases of upper leaves coloured | ... | ... | ... | ... | heterophylla (cultivated), p. 259. |
| | The entire surface of upper leaves coloured | ... | ... | ... | ... | pulcherrima (cultivated), p. 259. |
| 3 | Stems and branches thick and fleshy | ... | ... | ... | ... | 4 |
| | Stems and branches not thick and fleshy | ... | ... | ... | ... | 7 |
| 4 | Plants armed with spines | ... | ... | ... | ... | 5 |
| | Plants not armed with spines; branches cylindrical | ... | ... | ... | ... | Tirucalli, p. 259. |
| 5 | Leaves absent or much reduced | ... | ... | ... | ... | 6 |
| | Leaves well-developed, 6-8 in. long, oblanceolate | ... | ... | ... | ... | Nivulia (planted), p. 259. |
| 6 | Branches straight, thick and broad | ... | ... | ... | ... | antiquorum, p. 260. |
| | Branches much twisted, rather slender | ... | ... | ... | ... | tortilis, p. 260. |
| 7 | Leaves opposite | ... | ... | ... | ... | 8 |
| | Leaves alternate, linear or linear-lanceolate, 1-1½ in. long | ... | ... | ... | ... | dracunculoides, p. 260. |
| 8 | Involucre without petal-like limbs | ... | ... | ... | ... | 9 |
| | Involucre having conspicuous petal-like limbs | ... | ... | ... | ... | 12 |
| 9 | Erect or ascending herbs; leaves 1-1½ in. long | ... | ... | ... | ... | hirta, p. 260. |
| | Prostrate herbs; leaves less than 1/3 in. long | ... | ... | ... | ... | 10 |
| 10 | Stems hairy; capsule wholly or partly covered with stiff hairs; leaves longer than broad | ... | ... | ... | ... | 11 |
| | Stems not hairy; capsule not hairy; leaves minute, nearly as long as broad | ... | ... | ... | ... | microphylla, p. 260. |
| 11 | Lobes of capsule rounded, covered with stiff hairs; seeds faintly furrowed; leaves slightly crenate at tip; nerves obscure | ... | ... | ... | ... | thymifolia, p. 261. |

- Lobes of capsule angled, covered with stiff hairs along the edges; seeds deeply furrowed; leaves minutely toothed; nerves 3, starting from the base, prominent ... prostrata, p. 261.
- 12 Involucres single or few together; petal-like limb cut into comb-like segments cristata, p. 261.
- Involucres numerous, clustered together; petal-like limb entire 13
- 13 The upper pair of petal-like limbs much larger than the lower pair rosea, p. 261.
- Petal-like limbs nearly equal 14
- 14 Leaves $\frac{1}{2}$ -1 in. long; a slender erect herb hypericifolia, p. 261.
- Leaves $\frac{1}{4}$ - $\frac{1}{2}$ in. long; a stiff prostrate herb with a stout underground axis corrigioides, p. 262.

Euphorbia heterophylla, Linn. Painted Leaf

An erect annual. Leaves alternate, ovate or fiddle-shaped, margins wavy or entire, 2-3 in. long. The upper floral leaves opposite, pink at the base and green towards the apex. Flowers in September and October.

A native of North America. Introduced for gardens from which it has escaped.

Euphorbia pulcherrima, Willd. (*Poinsettia pulcherrima*, Grah.)

A shrub. Upper floral leaves large, crimson. Flowers small, green. A native of Mexico planted in gardens.

Euphorbia Tirucalli, Linn. Milk Hedge

கிருக்கள் ளி தீமூடு

A small tree. Branches green, cylindrical, practically leafless, the small linear-oblong leaves falling away very soon. Flowers small, greenish, clustered in the forks of branches. Fruit a capsule, $\frac{1}{4}$ in. in diameter. Flowers March to August.

A native of Tropical Africa cultivated as a hedge-plant. Frequently met with by the side of the little shrines dedicated to village deities. Often found run wild. Not so common in Madras City area as in other parts of the Presidency.

Euphorbia Nivulia, Ham.

இலைக்கள் ளி அகத்தீமூடு

A small thorny tree. Branches cylindrical. Leaves fleshy, obovate-oblong, sessile, glabrous, 4-8 in. long. Flowers in small cymes above the leaf-scars, yellowish-green. Fruit a triangular capsule $\frac{1}{4}$ in. broad. Flowers in February and March.

A native of hill tracts and open forests in South India (Nagalapuram and Nagari). Often found in Madras compounds. The milky juice is used in medicine.

Euphorbia antiquorum, Linn.

சுதுரக்கள்ளி

Pl. XXXI, A.

பெருங்கைமரம்

A thorny cactus-like shrub or small tree. Stems triangular in section. Leaves small, soon falling so that the plant appears leafless. Flowers in small cymes, greenish-yellow. Fruit a capsule, $\frac{1}{2}$ in. across. Flowers November to January. In scrub jungle. Pallavaram. Vandalur. Avadi.

Euphorbia tortilis, Rottl.

பெருங்கைமரம்

Similar to the preceding species in general appearance, but the branches slender and much twisted. Anthers red. Flowers in December and January.

Occasionally met with planted in hedges. I have not found this plant wild in our area.

Euphorbia dracunculoides, Lamk.

An erect branching herb with a number of stems starting from the root. Leaves in the upper part of the stem opposite, the lower ones alternate, linear-lanceolate, sessile, the median nerve alone clearly visible, $1-2\frac{1}{2}$ in. long. Involucres single. Glands half-moon-shaped, 2-horned. Flowers January to March.

A roadside weed. Milky juice was absent in the specimens I examined.

Euphorbia hirta, Linn. (*Euphorbia pilulifera*, Linn.)

அம்மான்பச்சரிசி

Pl. XXXI, B.

பெருங்கைமரம்

A hairy annual, erect or ascending. Leaves with the two halves unequal, ovate-lanceolate, serrate, $\frac{1}{2}-1\frac{1}{2}$ in. long. Involucres numerous, crowded together. Petal-like limbs absent or if present very minute. Flowers all the year round.

A very common weed of waste places. The leaves and the roots are used in Indian medicine.

Euphorbia microphylla, Heyne

A small glabrous prostrate annual. Stems many, starting from the root. Leaves quite small, nearly as broad as long, minutely toothed in the upper part, slightly notched at apex. Involucres numerous. Flowers in July and August.

Growing in patches in dried up bottoms of tanks.

Euphorbia thymifolia, Linn.

கின்னம்மான்பச்சரிசி

రజ్జీవారి నానుబాలు (చిన్నది)

A small prostrate annual herb. Stems many, more or less hairy, often pink. Leaves small, the two halves unequal, slightly crenate in the upper part, nerves obscure, often pink, under $\frac{1}{4}$ in. long. Involucres small. Lobes of capsule rounded, hairy. Seeds faintly furrowed transversely. Flowers in the rainy weather and after.

Common in waste places.

Euphorbia prostrata, Ait.

A small prostrate herb. Stems many starting from the base, very minutely hairy or not. Leaves very minutely toothed or not, oblong, the two halves unequal, nerves three radiating from the base, $\frac{1}{4}$ in. long. Capsules slightly larger than in the preceding species, the lobes angled, covered with stiff hairs along the edges. Seeds deeply furrowed transversely. Flowers in July and after.

An introduced weed; a native of the West Indies. I collected this species in the Museum compound in July, 1921.

Euphorbia cristata, Heyne

A small prostrate hairy annual. Leaves ovate, cordate, slightly serrate, $\frac{1}{3}$ – $\frac{2}{3}$ in. long. The floral leaves in a rounded head, imbricate. Involucre standing singly, petal-like limbs 4, cut into comb-like segments. Lobes of capsule rounded, hairy. Seeds white. Flowers in February.

Hills at Pallavaram.

Euphorbia rosea, Retz.

A glabrous prostrate herb. Stems numerous starting from the base. Leaves obovate, gradually narrowed below from the rounded apex, the two halves unequal, slightly serrate, $\frac{1}{4}$ – $\frac{5}{8}$ in. long. Petal-like limbs of involucre rose-coloured, very conspicuous, the two upper ones very much larger than the two narrow lower ones. Styles long. Flowers October to December.

Abundant on the sand dunes at Ennur.

Euphorbia hypericifolia, Linn.

A slender glabrous annual, erect or tending to be erect. Leaves oblong, slightly serrate, the two halves unequal, $\frac{1}{2}$ –1 in. long. Involucres clustered in the axils of leaves or at the ends of branches. Petal-like limbs small, white or slightly pink. Styles very short. Capsules hairy. Seeds reddish.

Borders of cultivated fields. Common.

Euphorbia corrigioides, Boiss.

A stiff herb with numerous trailing branches starting from a stout underground axis which remains perennially underground. Leaves oblong, slightly serrate, leathery in texture, often blotched with red, $\frac{1}{2}$ - $\frac{5}{8}$ long. Involucres crowded in the axils of leaves or at the ends of branches. Petal-like limbs white. Seeds smooth. Flowers April to September.

Museum compound. Fallow fields near Chetpat and Kodambakam.

Pedilanthus, Neck.*Pedilanthus tithymaloides*, Poit.

A small shrub abounding in milky juice. Leaves ovate, acuminate, fleshy, about 3 in. long. Involucre scarlet, slipper-shaped. A native of South America often used for borders of garden walks.

Hemicyclia, Wt. & Arn.

Trees or shrubs. Male and female flowers on separate plants. Male flowers clustered together. Stamens 6-27. Female flowers few together or standing singly. Ovary 1-celled, having 2 ovules.

Hemicyclia sepiaria, Wt. & Arn.

A small evergreen tree with rigid branches. Leaves elliptic-oblong, shiny, leathery, $1\frac{1}{2}$ - $3\frac{1}{2}$ in. long. Flowers very small, greenish-yellow. Fruit crimson, edible, $\frac{1}{3}$ in. in diameter. Flowers in March.

Vandalur.

Cleistanthus, Hook.

Trees or shrubs. Leaves alternate, entire. Flowers small. Calyx of 5 or 6 lobes in the male flowers; in the female flowers forming a cup under the ovary. Inner perianth-segments alternating with the outer ones, minute. Stamens 5 or 6. Ovary 3-celled. Ovules 2 in each cell. Styles 3, 2-branched. Fruit a capsule.

Cleistanthus collinus, Benth.

ஒடுக்கன்

A small tree. Leaves circular or obovate, leathery, glabrous, $1\frac{1}{2}$ -4 in. long. Flowers in clusters in the axils of leaves, small, yellowish. Fruit a roundish, hard, shiny, brown, woody capsule $\frac{2}{3}$ -1 in. in diameter. Flowers in April.

Vandalur Hills.

Fluggea, Willd.

Shrubs, usually armed with spines. Leaves small. Male and female flowers on different plants. Male flowers with 5 perianth-segments, 5 stamens and a sterile pistil. Female flowers with 5 perianth-segments and a 1- to 3-celled ovary with 2 ovules in each cell. Styles 2-branched. Fruit fleshy outside.

Fluggea Leucopyrus, Willd.

மாப்புல்லாந்தி

తెల్లపులుగుడు

A stiff thorny shrub. Leaves obovate-circular, glabrous, $\frac{1}{2}$ -1 in. long. Flowers in clusters in the axils of leaves, very small, greenish-white. Fruit fleshy, white, round, $\frac{1}{4}$ in. in diameter. Flowers in July and August.

In dry open situations and in scrub jungle.

Agyneia, Vent.

Loosely spreading herbs. Male flowers arranged in clusters in the axils of leaves. Sepals 6, thickened except at the white margins. Stamens 3. Female flowers large, standing singly. Sepals not margined. Ovary ovoid, 3-celled, truncate at apex. Styles very short, sunk in a depression on the top of the ovary. Ovules 2 in each cell. Capsule splitting into 3 pieces.

Agyneia bacciformis, A. Juss.

An annual herb with straggling branches. Leaves sessile, obovate-oblong, fleshy, nerves inconspicuous, $\frac{1}{2}$ in. long. Flowers minute. Capsule roundish-ovoid, $\frac{1}{4}$ in. long. Flowers October to February.

In grassy places.

Phyllanthus, Linn.

Herbs or shrubs. Leaves alternate, the branches often resembling pinnate leaves. Stipules narrow. Flowers very small. Perianth-lobes 5 or 6, imbricate. Stamens 3. Filaments free or united. Ovary 3-celled. Styles 3, 2-branched at tip. Fruit a capsule.

- 1 Filaments united into a column 2
 Filaments free; leaves linear-oblong, the nerves invisible, up
 to $\frac{3}{4}$ in. long simplex.
- 2 Stipules peltate; leaves obovate, wedge-shaped at base,
 $\frac{3}{4}$ -1 $\frac{1}{4}$ in. long maderaspatensis.
 Stipules not peltate; leaves circular or oblong, not wedge-
 shaped at base, under $\frac{1}{2}$ in. in length 3
- 3 Leaves leathery or fleshy, circular rotundifolius.
 Leaves thin, oblong, the branches resembling pinnate leaves. Niruri.

Phyllanthus simplex, Retz.

A stiff herb with a number of long flattened branches arising from the base. Leaves linear-oblong, the nerves invisible, $\frac{1}{2}$ - $\frac{3}{4}$ in. long. Flowers standing singly or few together in the axils of leaves. Female flowers more numerous and larger than the male ones. Flowers August to March.

A very common weed.

Phyllanthus maderaspatensis, Linn.

Pl. XXXI, C.

An erect or somewhat erect herb 1-3 ft. high. Leaves obovate, wedge-shaped at base, glabrous, somewhat leathery, $\frac{1}{2}$ -1 in. long. Stipules lanceolate, peltate. Male flowers much smaller than the female. Perianth-lobes 6. Filaments of anthers very much reduced in length. Capsule $\frac{1}{8}$ in. in diameter. Flowers August to March.

A very common weed.

Phyllanthus rotundifolius, Klein

An annual herb. Branches many arising from the base of the stem and trailing on the ground. Leaves circular, glabrous, up to $\frac{1}{3}$ in. in diameter. Flowers and capsules minute. Flowers in August.

An occasional weed. On open ground near Chetpat. I have collected this plant only once.

Phyllanthus Niruri, Linn.

கிழாநெல்லி நீலக் கிழா

A small branching glabrous herb. Leaves oblong, whitish beneath, $\frac{1}{4}$ - $\frac{1}{2}$ in. long. Branches often appearing like pinnate leaves. Flowers numerous, minute. Flowers in the rainy and cold seasons.

A very common weed of cultivated places. The plant is used in Indian medicine.

Kirganelia, Baill.

Shrubs, climbing or straggling. Leaves thin. Perianth-segments 5, the 3 inner often larger. Stamens 5, in 2 series, the outer with free filaments, the inner 2 or 3 with the filaments united into a column. Ovary 5- to 12-celled. Ovules 2 in each cell. Stigmas not supported by styles. Fruit a fleshy, 5- to 12-celled berry.

Kirganelia reticulata, Baill. (*Phyllanthus reticulatus*, Poir.)

புல்லாந்தி வல்லுக்காய

A large straggling shrub. Leaves oblong or elliptic, glabrous, $\frac{1}{2}$ -1 $\frac{1}{4}$ in. long. Male flowers arranged in racemes in the axils of leaves. Female flowers standing singly. Berry small, purple, globose, $\frac{1}{4}$ in. in diameter. Flowers August to February.

In hedges and thickets.

Cicca, Linn.

Cicca disticha, Linn. (*Phyllanthus distichus*, Muell.) The Star Gooseberry

அருநெல்லை

ராமச்சிங்க

A small tree. Leaves ovate, acute, the two halves unequal, about 2 in. long. Flowers small, reddish, densely clustered. Fruit globose, fleshy, ribbed, 1 in. in diameter, acidic in taste. A native of Malay Peninsula. Often grown in gardens. The fruit is pickled.

Emblica, Gaertn.

Trees. Leaves small. Stipules minute, scale-like. Flowers very small. Perianth-segments 5 or 6, oblong. Stamens 3. Filaments united in a column. Ovary 3-celled. Ovules 2 in each cell. Fruit fleshy. Seeds 6, 3-angled.

Emblica officinalis, Gaertn. (*Phyllanthus Emblica*, Linn.) The Emblic Myrobalan

மேல்லை

கச்சிங்க

A moderate-sized tree. Leaves 2-ranked, close-set, linear, glabrous, up to $\frac{1}{2}$ in. long. Ultimate branches appearing like compound leaves. Flowers minute, greenish-yellow, often arising from the parts of twigs lower down than the leaves. Fruit globose, pale yellow when ripe, $\frac{1}{2}$ -1 in. in diameter. Flowers in August. Fruit ripen in March.

Guindy Park. Often planted in compounds. The fruit is pickled or dried and used in chutneys and extensively in Indian medicine. The tree is considered sacred by the Hindus.

Breynia, Forst.

Shrubs or small trees. Flowers minute, in the axils of leaves. Male flowers having a 5- or 6-lobed perianth and 3 stamens with their filaments united in a column. Female flowers with a 6-lobed perianth and a 3-celled ovary. Fruit fleshy.

Breynia rhamnoides, Muell.

மணிப்புல்லாந்தி

A large shrub. Leaves elliptic, glabrous, $\frac{1}{2}$ -1 $\frac{1}{2}$ in. long. Flowers in clusters, small, greenish-yellow. Styles very short in female flowers. Fruit globose, red, fleshy, $\frac{1}{4}$ in. in diameter. Flowers February to September.

In open situations and jungles.

Givotia, Griff.

A tree. Ultimate branches, inflorescence and under surface of leaves covered with minute whitish hairs. Leaves carried on long stalks, palmately ribbed. Male and female flowers on separate plants. Outer perianth-lobes 5. Inner perianth-lobes cohering together. Stamens 13-25. Filaments united below. Ovary 2- or 3-celled. Ovules 1 in each cell. Styles short, 2-branched at their ends. Fruit a roundish drupe, 1-seeded.

Givotia rottleriformis, Griff.

తెల్లపులికి

A moderate-sized tree. Leaves broadly ovate-circular, cordate at base, glabrous above, white and densely wooly below, 5- to 7-nerved from the base, up to 10 in. in diameter. Leaf-stalks 4-6 in. long. Flowers in cymes in the axils of leaves, green, $\frac{1}{2}$ in. in diameter. Fruit a globose drupe, $\frac{3}{4}$ -1 in. in diameter, green. Flowers in July.

Vandalur Hills.

Jatropha, Linn.

Shrubs or trees. Leaves palmately lobed. Perianth of an inner and an outer whorl. Calyx 5-lobed. Stamens 8 to many. Inner perianth sometimes absent in female flowers. Ovary 3-celled, with 1 ovule in each cell. Fruit a capsule.

Margins of leaves having gland-tipped hairs glandulifera.

Margins of leaves without gland-tipped hairs curcas (cultivated).

Jatropha glandulifera, Roxb.

దుండిగము

A shrub with somewhat stout branches. Leaves palmately 3- to 5-lobed, margins entire and studded with red gland-tipped hairs, $2\frac{1}{2}$ -5 in. long; gland-tipped hairs absent from the red petioles. Male flowers greenish-yellow, having 8 stamens, their filaments united into a column. Inner perianth absent in female flowers. Capsule $\frac{1}{2}$ in. long. Flowers during most parts of the year.

Very common in dry open situations and low scrub jungle.

Jatropha curcas, Linn.

A soft-wooded shrub. Leaves 3- to 5-lobed, roundish, cordate, up to 6 in. in diameter. Flowers yellowish-green. Stamens 10 in male flowers. Capsule roundish, 1 in. long. A native of Tropical America. Occasionally found in gardens. The seeds are a violent purgative.

Chrozophora, Neck.

Loosely-branching hairy herbs. Flowers in racemes in the axils of leaves. Male flowers crowded in the upper part of racemes. Stamens 5-15. An inner perianth-whorl of 5 segments present in both male and female flowers. Ovary 3-celled. Ovules 1 in each cell. Capsule hairy.

Chrozophora rottleri, Klotzsch. (*Chrozophora plicata*)

சுருங்குமரம்

An erect herb covered with silvery hairs. Leaves broadly ovate-circular, thick, sometimes slightly 3-lobed, wavy on the margins, densely hairy on both surfaces, 2-4 in. in diameter. Petiole 2 in. long. Flowers in hairy racemes. Stamens 15 in male flowers. Inner perianth-whorl much reduced in female flowers. Styles 2-branched, red. Capsule hairy, red, blue when wetted. Flowers in February and March.

Borders of paddy fields.

Codiaeum, Rumph.*Codiaeum variegatum*, Blume

Under this name are included a large number of ornamental shrubs commonly known as 'crotons' many varieties of which are cultivated. They vary a great deal in the size, form and leaf-colour. Their original home is the islands of the Pacific, particularly the Moluccas.

Croton, Linn.

Shrubs or trees, usually with two glands at the base of leaves. Flowers in spikes or spike-like racemes. An inner perianth-whorl of five segments present in the male flowers. Stamens 5 or more. Inner perianth-whorl absent in female flowers. Ovary 3-celled, with a single ovule in each cell. Fruit a capsule. Seeds with a white spongy cap.

Croton sparsiflorus, Morung

Pl. XXXI, D.

A low shrub. Leaves ovate-lanceolate, serrate, acute at apex, glabrous, $1\frac{1}{4}$ - $2\frac{1}{2}$ in. long. Leaf-stalks $\frac{1}{2}$ in. long, a pair of glands present at the base. Flowers in slender racemes at the ends of branches. Male flowers occupying the upper part of the raceme. Female flowers fewer, occupying the lower part of the raceme. Stamens about 15 in male flowers. Outer perianth-segments green, the inner ones white, the latter absent in the female flower. Ovary hairy. Styles 3, each 2-branched at the extremity. Capsule 3-angled, roundish, $\frac{1}{2}$ in. long. Seeds shiny; spongy white cap conspicuous. Flowers and ripens fruit at most parts of the year.

A native of South America. Introduced into Bengal about the year 1898. It has since spread rapidly and has overrun a great part of Madura and Tinnevely Districts. Its first appearance in Madras was noted by me in October, 1922, on the shore near the harbour. In September, 1924, I noticed a colony of this plant on the banks of the Buckingham Canal near Basin Bridge. It has occupied the vacant land near Basin Bridge Junction. A few plants have sprung up on the railway line beyond Chetpat (March, 1929).

Tragia, Linn.

Twining or climbing, stinging herbs. Leaves 3-lobed or divided into 3 leaflets. Flowers in racemes, the male ones occupying the upper part of the raceme and the fewer female ones the lower part. Male flowers having 3 perianth-segments and 3 stamens. Female flowers having 6 perianth-segments and a 3-celled ovary with a single ovule in each cell. Fruit a 3-celled bristly capsule.

Leaves not lobed; styles coiled involucrata.

Leaves 3-partite almost to the base; styles slightly spread-

ing, not coiled cannabina.

Tragia involucrata, Linn. Indian Stinging Nettle

காஞ்சொறி Pl. XXXI, F. மூலநீண்டி

A climbing herb covered with rough hairs. Stinging hairs present all over the plant. Leaves oblong-lanceolate to ovate, 3-lobed, serrate, 2-4 in. long. Sterile ovary present in the male flowers. Perianth of female flowers enlarging in fruit. Styles 3-coiled. Capsule 3-lobed, hairy, $\frac{1}{3}$ in. in diameter. Flowers September to February.

In jungly places overgrown with weeds.

Tragia cannabina, Linn. (Tragia involucrata, var. cannabina, Muell.)

சிறுகாஞ்சொறி மூலநீண்டி

A coarsely hairy climbing shrubby herb with stinging hairs. Leaves palmately 3-partite almost to the base, up to 3 in. long; lobes prominently toothed, the middle lobe much longer than the side ones. Flowers similar to the preceding species. Styles 3 in female flowers, slightly spreading. Capsule 3-lobed, coarsely hairy, $\frac{3}{8}$ in. across. Flowers November to February.

On waste land near Red Hills. Ennur, along the railway line.

Ricinus, Linn.

Tall stately annuals or small trees. Leaves palmately lobed. Flowers in branching racemes, the female ones occupying the lower part of the raceme. Stamens numerous. Filaments repeatedly branching. Styles 3, 2-cleft, red. Capsule 3-lobed, prickly throughout, with 3 large-seeds. Seeds furnished with a white spongy outgrowth at the top.

Ricinus communis Linn. The Castor-oil Plant

ஆமணக்கரு அமுகபுஞ்செட்டி

A bush or a small tree. Leaves about 1 foot in diameter, carried on long stalks, reddish or green; lobes serrate, acuminate. Calyx of male flowers, $\frac{1}{2}$ in. long. Seeds oblong, smooth, mottled, with a white spongy portion at the top.

There are two varieties of this species, a tall annual and a small tree. The former is the one commonly met with in Madras on waste land in the neighbourhood of villages. A native of South Africa thoroughly naturalized in India. The cold-drawn oil from the herbaceous variety is considered superior to the oil got from the tree. It is used in medicine and as a lamp-oil and lubricant.

Gelonium, Roxb.

Shrubs or trees with scars of stipules on the branches. Male and female flowers on separate plants. Stamens varying in number. Female flowers having sterile stamens. Fruit a capsule.

Gelonium lanceolatum, Willd.

A small evergreen tree. Leaves leathery, obovate-oblong or elliptic to oblanceolate, glabrous, 2-4 in. long. Flowers arranged in clusters in the axils of leaves, small, green. Fruit a small capsule, 3-lobed, ridged along the middle of each lobe, $\frac{1}{3}$ in. in diameter. Flowers February to September.

Specimens of this species have not been collected by me, but Mr. Fischer has stated that it may be expected in the Madras area.

Acalypha, Linn.

Herbs. Flowers minute, clustered in spikes in the axils of leaves or at the ends of branches. Male flowers with a minute bract, occupying the upper part of the spike. Perianth-segments 4. Stamens 8-16. Female flowers surrounded by a large bract that remains in the fruit. Styles 3. Fruit a capsule.

Bracts large, longer than the capsules indica.

Bracts smaller, shorter than the capsules lanceolata.

Acalypha indica, Linn.

குப்பைமேனி Pl. XXXI, E. కప్పింబచెట్టు

An erect annual herb. Leaves ovate or rhomboid-ovate, crenate-serrate, base somewhat wedge-shaped, glabrous, 1-3 in. long. Petiole longer than the leaf-blade. Flowers arranged in spikes in the axils of leaves, the male ones fewer, minute, uppermost in the raceme which ends in a tuft of sterile flowers. Capsule coarsely hairy, concealed by the bract, often 1-seeded. Flowers in the rainy months.

A common weed of waste places. The leaves and roots are used in Indian medicine.

Acalypha lanceolata, Willd. (*Acalypha fallax*, Muell.)

A small herb profusely branching from the base. Leaves ovate to lanceolate, crenate-serrate, often wedge-shaped at base, 1-2 in. long. Spikes about 1 in. long. Male flowers minute, at the ends of spikes. Capsule covered with coarse hairs, crowned by the styles that are cut into numerous segments. Flowers August to November.

On waste ground.

Hooker in the Flora of British India says "I am very doubtful as to the name this species should bear. It is a most variable plant. The three extreme forms are (1) a short robust state, with short elliptic leaves not above 1 in. long with the blade longer than the petiole; (2) a common form with broad leaves and elongate, long-peduncled, lax-flowered spikes; and (3) an often more lanceolate-leaved form with shorter, sessile, dense-flowered spikes." I have collected forms 1 and 2 in Madras.

Micrococca, Benth.

Herbs. Flowers in clusters in racemes in the axils of leaves. Perianth of male flowers splitting into 3 lobes; of female ones larger. Stamens 3-30. Ovary 3-celled. Ovules 1 in each cell. Styles cleft into minute segments. Fruit a capsule.

Micrococca Mercurialis, Benth. (*Claoxylon Mercurialis*, Thw.)

An annual herb. Leaves ovate-lanceolate, crenate-serrate, acute, thin, glabrous, 1-2 in. long. Flowers in slender racemes up to 3 in. long. Male flowers having 5-10 stamens. Capsule hairy, separating into three 1-seeded units. Flowers September to January.

A common weed of waste places.

Excaecaria, Linn.

Glabrous trees or shrubs having milky juice. Male and female flowers on different plants, arranged in spikes in the axils of leaves. Segments of perianth 3. Stamens 3. Female flowers on short racemes. Ovary 3-celled, with 1 ovule in each cell. Fruit a capsule separating into 3 units.

Excaecaria Agallocha, Linn.

இலம்பு

Pl. XXXI, G.

தென் செட்டி

A small evergreen tree with poisonous milky juice. Leaves ovate-elliptic, shortly acuminate, glabrous, shiny, leathery, 2-3 in. long. Male flowers small, yellowish-green, with a fragrant odour, in spikes about 2 in. long. Racemes of female flowers $\frac{1}{2}$ in. long. Fruit a 3-angled capsule, about $\frac{1}{3}$ in. in diameter. Flowers August to October.

In tidal marshes near the sea. The milky sap of the tree causes great pain if it gets into the eye and hence the plant has been called the Blinding Tree.

Sebestiana, Spreng.

Herbs. Flowers in slender racemes. Female flowers standing singly at the base of racemes. Perianth-segments 5 in male flowers. Stamens 2-4. Female flowers with 3 perianth-segments. Ovary 3-celled with 1 ovule in each cell. Capsule splitting into 3 units.

Sebestiana Chamaelea, Muell.

An annual herb with a number of stems starting from the base. Leaves linear or narrowly oblong-elliptic, very slightly serrate, $\frac{3}{4}$ -2 in. long. Flowers yellowish-green, in short spikes. Perianth of female flowers larger than that of male. Styles 3, short. Capsule $\frac{3}{4}$ in. long, having 2 rows of very short spine-like protuberances on each of its 3 lobes. Flowers August to January.

In open situations and in jungles.

Moraceae

Trees or shrubs (no herbs in our area) containing milky juice. Leaves alternate. Stipules deciduous, often sheathing and leaving an annular scar. Flowers small, unisexual, arranged in cymes or in clusters or often crowded on the surface of a fleshy flat, concave or globose receptacle which are sometimes hollow and closed. Perianth usually of 4 or 5 segments, sometimes absent. Stamens as many as the perianth-segments and opposite to them or sometimes single. Ovary 1-celled. Ovules single. Style often not vertical. Fruit an achene or drupe, sometimes many united together into a globose fleshy mass.

- | | | | | | | | |
|---|--|-----|-----|-----|-----|-----|---------------------|
| 1 | Flowers not exposed, arranged on the inner wall of a closed receptacle | ... | ... | ... | ... | ... | Ficus. |
| | Flowers exposed | ... | ... | ... | ... | ... | 2 |
| 2 | Stamens 1 in each male flower | ... | ... | ... | ... | ... | Artocarpus |
| | Stamens 4 in each male flower | ... | ... | ... | ... | ... | (cultivated).
3 |
| 3 | Calyx growing and becoming fleshy in fruit | ... | ... | ... | ... | ... | Morus (cultivated). |
| | Calyx not growing and not becoming fleshy in fruit | ... | ... | ... | ... | ... | 4 |
| 4 | Perianth of female flowers united; styles undivided | ... | ... | ... | ... | ... | Plecosperrum. |
| | Perianth of female flowers consisting of 4 separate segments; style 2-branched | ... | ... | ... | ... | ... | Streblus. |

Ficus, Linn.

Trees or shrubs with milky juice. Stipules covering the bud and later falling away. Flowers minute, male, female, gall and at times neuters crowded on the inner walls

of a fleshy receptacle, the mouth of which is closed by imbricating bracts. All the forms of flowers met with in the same receptacle or not. Male flowers with a 2- to 6-lobed perianth and 1 or 2 stamens. Female flowers with a perianth like that of the male. Fruit an enlarged hollow closed receptacle, the inner wall of which is studded with hard or fleshy achenes.

- | | | | | | |
|---|--|-----|-----|-----|--------------|
| 1 | Male flowers with a rudimentary pistil | ... | ... | ... | gibbosa. |
| | Male flowers without a rudimentary pistil | ... | ... | ... | 2 |
| 2 | Male flowers with 2 distinct anthers, their filaments being united | ... | ... | ... | glomerata. |
| | Male flowers with only one anther | .. | ... | ... | 3 |
| 3 | Male, gall and female flowers found in the same receptacle | | | | 4 |
| | Male and gall flowers in one set of receptacles, females in another | ... | ... | ... | hispida. |
| 4 | Leaf-stalks short, not jointed at junction with the blade; leaves leathery | ... | ... | ... | 5 |
| | Leaf-stalks long, usually jointed to the blade; leaves thin or not very leathery | ... | ... | ... | 7 |
| 5 | Leaves softly and minutely hairy | ... | ... | ... | bengalensis. |
| | Leaves glabrous | ... | ... | ... | 6 |
| 6 | Receptacles blood-red; branches drooping | ... | ... | ... | Benjamina. |
| | Receptacles yellow or reddish; branches not drooping | ... | ... | ... | retusa. |
| 7 | Apices of leaves acuminate | ... | ... | ... | religiosa. |
| | Apices of leaves not acuminate | ... | ... | ... | Tsiela. |

Ficus gibbosa, Blume, var. *parasitica*, Koen.

கல்லத்தி కొండజువ్వి

A fair-sized tree often embracing other trees at first. Leaves leathery, more or less rhomboid, rough, 3-6 in. long. Receptacle yellow when ripe, $\frac{1}{3}$ in. in diameter. Flowering and fruit ripening March to August.

Border of Mambalam Tank. Not common.

Ficus glomerata, Roxb. The Indian Fig

அத்திமரம் అల్లి చెట్టు, మేడిచెట్టు.

A large deciduous tree. Leaves ovate-oblong or elliptic-lanceolate, glabrous, 3 nerves starting from the base, 3-6 in. long. Flowers and fruit on very short branches issuing from the larger branches or the trunk. Receptacle red when ripe, $1\frac{1}{4}$ in. in diameter. Flowering and fruit ripening at various parts of the year.

Cultivated and wild. The fruit is edible.

Ficus hispida, Linn.

பேயத்தி Pl. XXXII, C. பழம் மீட்டி

A shrub usually with hollow internodes. Leaves ovate-oblong, rough above, covered with coarse hairs below, 4-12 in. long. Flowers and fruit arising from the axils of leaves and also on short branches that come from the main branches or trunk or even from the roots. Receptacle up to 1 in. in diameter, yellowish. Flowering and fruit ripening August to October.

Common in jungly places. Near Kodambakam. The fruit have emetic properties. There is a popular belief that the fruit if eaten causes madness.

Ficus bengalensis, Linn. The Banyan

ஆலமரம் மட்டிச்செట్టు

A very large evergreen tree with numerous aerial roots some of which descend to the soil and become pillar-like. Leaves elliptic-ovate, 4-8 in. long. Receptacle red, ripening from October to January.

A very common tree both wild and planted. There is a particularly good specimen in the Theosophical Gardens, Adyar. The tree is sacred to the Hindus.

Ficus Benjamina, Linn. The Java Fig

A large evergreen tree with drooping branches and numerous aerial roots. Leaves broadly ovate-elliptic, bluntly acuminate, leathery, shiny, 2-4 in. long. Receptacles in axillary pairs, blood-red when ripe, $\frac{1}{3}$ in. in diameter.

Planted in avenues. Not a native of India.

Ficus retusa, Linn.

பெண்ணா

A large evergreen tree. Leaves elliptic or obovate, glabrous, leathery, shiny above, 2-4 in. long. Receptacle yellow or reddish when ripe, $\frac{1}{3}$ in. in diameter.

In open forests. Guindy Park.

Ficus religiosa, Linn. The Peepul Tree

அரசமரம் பச்சைமரம், ராவி செట్టు

A large tree. Leaves ovate-circular, $\frac{1}{2}$ in. in diameter, with a long apex, glabrous, shiny, 4-7 in. long. Receptacle dark purple. Flowers July to September.

Frequently planted near temples and occasionally elsewhere. The tree is very sacred to the Hindus.

Ficus Tsiela, Roxb.

பெண்ணா

A large tree. Leaves elliptic-lanceolate, thin, leathery, glabrous, 3-5 in. long. Receptacle purple when ripe, $\frac{1}{2}$ in. in diameter. Flowers and fruit ripen May to August.

Planted at roadsides. A native of forest tracts.

Artocarpus, Forst.

Evergreen trees with milky juice. Leaves alternate, leathery. Flowers 1-sexual, crowded on globose or oblong receptacles consisting of either all male or all female. Male flowers having a 2-to 4-lobed perianth and a single stamen. Female flowers having a tubular perianth and an ovary consisting of a single ovule. Fruit large, being an enlargement of the female receptacle.

Leaves entire	...	...	...	...	...	...	...	integrifolia.
Leaves pinnately cut	...	...	...	...	...	...	...	incisa.

Artocarpus integrifolia, Linn. The Jack Tree

பலாமரம் பசு

A fair-sized tree, a native of the Western Ghats. It is cultivated in Madras to a small extent for its large aggregate fruit which is produced by an assemblage of flowers. The wood is much valued for making furniture.

Artocarpus incisa, Linn. The Bread Fruit Tree

கொட்டிப்பலா

A native of Java occasionally grown in Madras gardens.

Morus, Linn.

Morus indica, Linn. The Indian Mulberry

கம்பளிச்செடி பிழிவண்டு பூ

A shrub. Leaves ovate, serrate, acuminate, $1\frac{1}{2}$ - $2\frac{1}{2}$ in. long. Flowers arranged in spikes. Fruit dark red, sweet. Flowers in August.

A native of temperate Himalayas occasionally grown in Madras gardens.

Plecosperrum, Trécul

Shrubs or trees. Male and female flowers on separate plants. Male flowers with 4 perianth-lobes, 4 stamens bent inwards in bud and a rudimentary ovary. Female flowers united into a fleshy head and having a 4-toothed perianth and a 1-celled ovary with a single ovule. Fruit fleshy.

Plecosperrum spinosum, Trécul

A large thorny straggling shrub. Leaves obovate or elliptic, shiny, 2-3 in. long. Flowers arranged in heads in the axils of leaves, green. Fruit $\frac{1}{2}$ in. in diameter. Flowers February to April.

This species has been included on the authority of Mr. Fischer.

Streblus, Lour.

Trees or shrubs with milky juice. Leaves rough. Male and female flowers on separate plants. Male flowers in spikes or heads. Female flowers 1-4 together. Perianth-segments 4 in both male and female flowers. Male flowers having 4 stamens bent down

in bud. Style in female flowers arising vertically from the apex of the ovary. Fruit roundish, covered by the persistent perianth.

Streblus asper, Lour.

பிராயமரம் ஐசெக் செட்டி

A small evergreen tree or large shrub having milky juice. Leaves elliptic, rhomboid or obovate, rough, 1-3 in. long. Flowers arranged in the axils of leaves, greenish-yellow. Fruit small, yellow, edible. Flowers in February and March.

In scrub jungle. Avadi. Guindy Park. Vandalur. The milky juice is used in Indian medicine.

Urticaceae

Herbs (in our area). Leaves opposite or alternate. Flowers small, greenish, unisexual, arranged in spikes or heads. Perianth of 4 or 5 sepals, usually united in female flowers. Stamens as many as sepals, usually inflexed in bud. Sterile ovary present in male flowers. Ovary 1-celled. Ovules single. Fruit a drupe or an achene, usually enclosed in and often adherent to the perianth.

Stipules on either side united; flowers in peduncled, dichotomous cymes. *Pilea*.

Stipules free; flowers in sessile clusters *Pouzolzia*.

Pilea, Lindl.

Leaves in opposite pairs, 3-ribbed, serrate. Perianth of male flowers consisting of 2-4 sepals; of female ones of 3 unequal sepals. Fruit an achene.

Pilea microphylla, Liebm. (*Pilea muscosa*, Lindl.) The Gunpowder Plant

A small prostrate herb. Leaves very small, spatula-shaped or circular, entire. Flowers minute, appearing in the rainy months.

A native of South America introduced as a bordering plant into gardens from which it has escaped. The ripe pollen is ejected from the anthers when the plant is shaken.

Pouzolzia, Gaud.

Leaves alternate, entire, 3-nerved at the base, gradually getting smaller upwards. Flowers minute, 1-sexual. Male flowers with 4 or 5 perianth-segments, 4 or 5 stamens and a rudimentary ovary. Female flowers with a tubular perianth. Stigma slender, jointed at the junction with the ovary, soon falling. Fruit a small achene.

Perianth-segments in male flowers 4; stamens 4 *indica*.

Perianth-segments in male flowers 5; stamens 5 *auriculata*.

Pouzolzia indica, Gaud.

A slender, somewhat hairy herb. Stem erect. Leaves ovate-lanceolate, entire, acute, hairy on both surfaces, $\frac{3}{4}$ - $1\frac{3}{4}$ in. long. Leaf-stalks short. Flowers minute, in small clusters in the axils of leaves. A small sterile ovary present in male flowers. Female

flowers with a tubular, ribbed perianth, 2-cleft at apex and closely covering the small achene. Flowers in November and December.

Ennur, on the path leading to the salt-pans.

Pouzolzia auriculata, Wt.

An erect annual herb with flaccid stems. Stems cylindrical below, 4-angled and drooping above. Branches covered with rough hairs. Leaves thin, ovate-lanceolate, entire, acute, hairy on both surfaces, strongly 3-nerved, up to $1\frac{1}{2}$ in. long, gradually getting smaller upwards, the end ones $\frac{1}{4}$ in. long. Leaf-stalks short. Flowers minute, clustered in the axils of upper leaves. Male flowers with 5 perianth-segments. Stamens 5. Anthers red. Female perianth ribbed, closely investing the small fruit, not winged. Flowers in October.

Rice fields near Nungambakam (1922). Not common.

Casuarinaceae

A family with only one genus.

Casuarina equisetifolia, Forst. The Casuarina or Beefwood Tree

செவ்வெருது Pl. XXXII, D. చాకుచెట్టు

A fair-sized leafless tree having green, slender, filament-like twigs. Male flowers arranged in spikes at the ends of branches. Female flowers arranged in heads. Fruit somewhat cylindrical, $\frac{3}{4}$ in. long.

A native of Australia. It was introduced into Madras at the beginning of the last century. It thrives well on sandy tracts near the sea and extensive plantations can be seen at Ennur and at Adyar. The wood is a good fuel and the introduction of this tree has solved the problem of fuel-supply for the City of Madras.

Ceratophyllaceae

Water-plants. Leaves whorled, cleft into thread-like segments. Flowers minute. Male flowers standing singly. Perianth of 6-12 narrow segments. Stamens 20-30. Female flowers having a 1-celled ovary containing a single ovule.

Ceratophyllum, Linn.

Characters same as those of the family.

Ceratophyllum demersum, Linn.

Pl. XXXII, E.

A much-branched herb growing under water. Leaves much-segmented into thread-like divisions, about 1 in. long. Fruit small, beaked with the persisting style.

In ponds. Very common.

GYMNOSPERMS

Cycadaceae

Shrubs or small trees. Trunk with a crown of leaves at the top, sometimes forked. Leaves pinnately divided. Male and female flowers on separate plants, without perianth, arranged on scales or modified leaves more or less grouped into cones. Anthers 1-celled, crowded on the undersides of flat fleshy scale-like leaves. Ovules large, not supported on stalks but arranged on the margins of carpellary leaves crowded round the apex of the stem and usually forming cones. Seeds large. Cotyledons 2.

Cycas, Linn.

Trunk bearing the woody bases of the petioles of old leaves. Leaflets numerous, linear, 1-nerved, entire, the lower ones often reduced to spines. Male cones at the top of the stem, carried on stalks. Anther-bearing scales numerous, closely imbricate, wedge-shaped at base, markedly acuminate at apex. Anthers in groups of 3-5. Carpellary leaves numerous, crowded round the apex of the stem, elongate, flattened, densely wooly, expanded into a blade-like portion at the top, at first forming a cone, later spreading. Ovules 1-5 on either side of the carpellary leaf below the blade-like part, arranged alternately in notches along the margins. Seeds ellipsoid to round.

Cycas circinalis, Linn.

அவிஞ்சிம் கீரீத

A small evergreen palm-like tree. Bark brown, smooth below and having scars of fallen leaves above. Leaves 5-9 ft. long. Petioles up to 2 ft. long, bearing short spines near the base. Leaflets with flat margins, blunt or acute at apex, leathery, dark green and shiny above, 8-12 in. long, $\frac{1}{3}$ - $\frac{1}{2}$ in. broad. Blade-like portions of carpellary leaves ovate-lanceolate, distinctly acuminate, margins closely cut into numerous teeth. Ovules 3-5 on either side. Seeds ovoid, bluish-grey, $\frac{3}{4}$ in. in diameter, ripening in the cold weather. Flowers about August.

Covelong, on the sea-shore close to the lagoon. On the sides of the Buckingham Canal near the Covelong Lock. It occurs on Kambakkam and Chengleput Hills but not at Vandalur. This is the only gymnospermous plant growing wild in our area. It is occasionally found in gardens. The leaves are believed to possess the property of killing puchis injurious to crops and are often stuck into paddy fields for that purpose. They are also plaited into mats. The seeds are dried in the sun, ground into flour, mixed with a smaller proportion of rice-flour and made into cakes which are eaten by the poorer classes.

Another common gymnospermous tree grown in Madras gardens is *Auracaria Cunninghamii*, a native of Queensland. It is a handsome quick-growing evergreen tree with whorls of straight branches which get gradually shorter towards the top so that it assumes a pyramidal shape.

MONOCOTYLEDONS

Hydrocharitaceae

Water-plants. Flowers enclosed in an entire or 2-leaved spathe, unisexual, the male and female flowers on separate plants (sometimes bisexual as in *Ottelia*). Sepals and petals alike, 3 each, the latter often absent. Stamens 3-12 in male flowers. Female flowers having an inferior 1-celled ovary with numerous ovules attached to the walls of the ovary. Fruit ripening under water.

- | | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-----|----------------------|
| 1 | Fresh-water plants | ... | ... | ... | ... | ... | ... | 2 |
| | Sea-water plants | ... | ... | ... | ... | ... | ... | <i>Halophila</i> . |
| 2 | Stem branching; leaves in whorls of 3 or 4; underground stems absent | ... | ... | ... | ... | ... | ... | 3 |
| | Stem short unbranched; leaves crowded on a small axis; creeping underground stems present | ... | ... | ... | ... | ... | ... | 4 |
| 3 | Male flowers with 3 stamens | ... | ... | ... | ... | ... | ... | <i>Hydrilla</i> . |
| | Male flowers with 9 stamens | ... | ... | ... | ... | ... | ... | <i>Elodea</i> . |
| 4 | Leaves long and narrow, not stalked; male flowers many together, enclosed in a spathe | ... | ... | ... | ... | ... | ... | 5 |
| | Leaves ovate-cordate, stalked; flowers standing singly | ... | ... | ... | ... | ... | ... | <i>Ottelia</i> . |
| 5 | Perianth consisting of 3 segments | ... | ... | ... | ... | ... | ... | <i>Vallisneria</i> . |
| | Perianth consisting of 6 segments | ... | ... | ... | ... | ... | ... | <i>Blyxa</i> . |

Halophila, Thouars

Submerged sea-plants. Stem creeping. Leaves opposite, pinnately nerved. Spathes small, one between 2 leaves, containing one flower each. Petals absent. Stamens 3 in male flowers. Styles 3 in female flowers. Ovules arranged in 2 series on the walls of the ovary.

Halophila ovata, Gaud.

Stems creeping and rooting at the nodes. A pair of scale-like stipules present at each node. Leaves elliptic-oblong, very thin, 2-3 in. long, $\frac{3}{4}$ in. wide. Midrib broad; side-nerves slender, oblique. Petiole long, slender.

Ennur, in shallow water in the sea. I have not found the flowers.

Hydrilla, Rich.

Submerged plants. Leaves short, 3 or 4 at each upper node, the lower ones opposite. Flowers minute. Male flowers single, within a spathe. Stamens 3. Female flowers 1 or 2 in a tubular 2-toothed spathe. Sepals green. Petals oblong in male flowers and narrow in female flowers. Ovary beaked. Styles 2 or 3. Stigmas fringed. Seeds 2 or 3.

Hydrilla verticillata, Presl.

Pl. XXXIII, A.

A fresh-water plant forming large masses, often rooting at the nodes. Leaves 4 or more at each node, the lowest ones opposite, linear-oblong, minutely serrate, very thin, up to $\frac{1}{2}$ in. long. Flowers $\frac{1}{6}$ – $\frac{1}{4}$ in. long. Fruit covered with spinules, carried on a long stalk which is due to the lengthening of the calyx-tube, sparsely covered with minute spines, $\frac{1}{4}$ in. long. Fruit ripening in March and April.

In tanks. Common.

Elodea, Michx.

Slender water-plants. Upper leaves whorled, the lower ones opposite, transparent, 1-nerved, not stalked. Flowers standing singly and enclosed by a tubular 2-cleft spathe. Sepals and petals 3 each in both male and female flowers. Stamens usually 9 in male flowers. Ovary 1-celled. Style slender. Stigmas 3. Fruit few-seeded.

Elodea canadensis, Michx.

Same characters as the genus. It resembles *Hydrilla verticillata* very closely and is often mistaken for it but can be recognized by its linear leaves and smooth fruit which are carried on elongate stalks due to the prolongation of the calyx-tube.

In ponds. This is a native of Canada and United States but has become naturalized in South India.

Ottelia, Pers.

Submerged or partially floating fresh-water herbs. Roots fibrous. Leaves crowded together, all proceeding from the much-reduced stem. Flowers standing singly, bisexual, enclosed by a spathe. Sepals and petals 3 each. Stamens 6–15. Ovary oblong, beaked, 6-celled. Ovules many. Styles 6, linear, 2-branched. Fruit oblong, enclosed by the spathe, winged.

Ottelia alismoides, Pers.

Pl. XXXIII, B.

A flaccid herb. Leaves circular-ovate, cordate, thin, margin wavy, 7- to 11-nerved at base, 2–4 in. long. Length of leaf-stalk varying with the depth of water. Spathes 5- or 6-winged, 1–1½ in. long. Flower-stalks also varying in length according to the depth of water. Sepals small, oblong, green. Petals nearly circular, white, yellow at the base, nerved, 1 in. long. Fruit ellipsoid, crowned by the withered perianth, 1–1½ in. long. Flowers December to February.

In ponds near Kilpauk Water Works. Pools near Red Hills Tank.

Vallisneria, Linn.

A submerged tufted plant having a horizontal underground axis. Leaves linear. Male flowers many, minute, in an ovoid 3-lobed spathe. Female flowers standing singly in a tubular 3-toothed spathe supported on a long stalk. Petals absent. Stamens 1-3 in male flowers. Female flowers with 3 sterile stamens. Ovules numerous. Fruit linear, included in the spathe.

Vallisneria spiralis, Linn.

Pl. XXXIII, C.

Leaves linear, entire, somewhat transparent, varying in length with the depth of the water, up to 15 in. long, all starting from a much-reduced stem. Spathes of male flowers on short stalks not more than $\frac{1}{4}$ in. long. Individual male flowers on slender stalks. Spathes of female flowers carried to the surface of water at the time of opening by the uncoiling of their long spiral filament-like stalks which after fertilisation coil again and bring the ovary down to ripen under water. Fruit linear, included in the spathe. Flowers November to January.

In pools and tanks. Common.

Blyxa, Noronha

Annual herbs. Leaves arranged in tufts on a short, reduced stem. Leaves linear, entire. Flowers enclosed in stalked spathes. Sepals and petals 3 each. Male flowers many together in a tubular 3-toothed spathe. Stamens 3-8. Sterile pistil usually present. Female flowers with a 1-celled ovary. Stigmas 3, filament-like. Fruit linear enclosed by the narrow spathe.

Blyxa octandra, Noronha ex Thouars (Blyxa Roxburghii, Rich.)

Leaves broad at base, finely acuminate, up to 18 in. long and $1\frac{1}{4}$ - $1\frac{1}{2}$ in. broad. Flowers white. Spathes of male flowers carried on stalks as long as or rather longer than the leaves. Stamens 8. Spathes of female flowers carried on thicker and slightly shorter stalks than in the male. Fruit linear, 2-4 in. long. Seeds small, tubercled, shortly tailed at each end. Flowers in November.

In pools of water in the neighbourhood of the Red Hills Tank.

Orchidaceae

Succulent plants, terrestrial or growing attached to trunks or branches of trees. Perianth of 6 divisions arranged in 2 series, adherent to the ovary, the 3 outer segments similar. Of the inner series, one, the lip, differing from the rest in shape and sometimes prolonged at the base into a spur. At the base of the lip in the axis of the flower there is the column composed of a single fertile stamen variously uniting with the style.

Anther 2-celled, each cell containing one or more masses of pollen. Stigma sticky. Fruit a 1-celled capsule splitting into 3 pieces. Seeds very many, minute.

Herbs with a bulbous underground part (in Madras species). *Eulophia*.

Herbs with tuberous underground parts *Habenaria*.

Eulophia, R.Br.

Terrestrial plants. Leaves long and narrow. Flowers arranged in racemes on a long axis.

Eulophia epidendrea, Fischer. (*Eulophia virens*, Brown)

Bulbous underground stem somewhat cone-shaped, emerging above ground. Leaves grass-like, many, 6-10 in. long, $\frac{2}{3}$ in. broad; midrib stout. Flower-bearing axis 1-3 ft. long. Bracts very small. Sepals and petals greenish with reddish nerves, up to $\frac{3}{4}$ in. long. Limb white. Spur short. Flowers September to December.

In scrub jungle at Pallavaram and Vandalur.

Habenaria, Willd.

Terrestrial herbs. Sepals unequal. Lip continuous with the column, produced at the base into a spur. Column continuous with the ovary.

Leaves 3-6, as broad as long *platyphylla*.

Leaves many, linear-lanceolate *viridiflora*.

Habenaria platyphylla, Spreng.

Plant up to 1½ ft. high. Leaves 3-6, lying flat on the ground, fleshy, circular or elliptic, not stalked, 2-4 in. long. Flowers white, fragrant, in dense-flowered short spikes. Flower-bearing axis 6-18 in. long, with numerous erect lanceolate sheaths up to the spike. Sepals oblong, up to $\frac{3}{8}$ in. long. Petals linear, $\frac{1}{6}$ in. long. Lip $\frac{1}{3}$ in. long. Spur 1½ in. long. Ovary 1 in. long. Flowers during the rains.

Vandalur Hills.

Habenaria viridiflora, R.Br.

Tuberous part of stem ovoid, up to 1 in. long. Leaves many, linear-lanceolate, acuminate, 2-4 in. long, $\frac{1}{3}$ - $\frac{1}{2}$ in. broad. Flower-bearing axis slender, up to 5 in. long, covered with numerous sheaths. Racemes many-flowered. Flowers greenish-yellow, $\frac{1}{3}$ in. in diameter. Lip longer than the sepals. Spur $\frac{3}{4}$ in. long. Ovary $\frac{3}{4}$ in. long. Flowers in September and after.

Vandalur Hills.

Vanda tessellata Hook. (*Vanda Roxburghii*, R.Br.)

An epiphytic plant with thick leathery leaves and moderately long racemes of fairly large pink and brown flowers. I have not collected this species in our area though it occurs on Kambakkam Hills. Common in gardens.

Scitamineae

Herbs, often large, frequently with a false stem made up of leaf-sheaths rolled one round the other. Leaf-blades with a strong mid-rib. Flowers bisexual, rarely unisexual. Sepals and petals 3 each, superior, the latter irregular. Stamens either only one perfect, the others replaced by staminodes, or 5 perfect with a sixth imperfect or obsolete one. Ovary 3-celled (rarely 1- or 2-celled). Ovules many. Fruit a capsule or fleshy.

The following species are well known in cultivation.

Canna indica, Linn.

A showy perennial herb. Stem 3-4 ft. high. Leaves oblong or elliptic-lanceolate, acuminate, up to 1½ ft. long. Flowers large, 2-2½ in. long. Fruit obscurely 3-lobed, up to 1 in. long. Seeds of the size of a pea, commonly known as Indian Shot. Flowers throughout the year.

Musa paradisiaca, Linn. and subspecies *sapientum*, K. Schum. The Banana

வாழைமரம் அரటిச்செய்யு

Commonly known as the Plantain, which name is incorrect.

Ravenala madagascarensis, Sonnerat. The Traveller's Palm

A tall plant reaching to a height of 30-40 ft. Leaves like those of the banana, but arranged in two rows on long stalks forming a fan-like head. The name Traveller's Palm is given to it on account of its capacity for storing water inside the sheath-like bases of leaves. A native of Madagascar grown in gardens.

Curcuma longa, Linn. Turmeric.

மஞ்சள்பசும் பசும்பூ చెయ్య

Cultivated in fields for the yellow substance of its underground stems.

Zingiber officinale. Roscoe Ginger

இஞ்சி அల్లము

Bromeliaceae

Ananas sativus, Schult. The Pine Apple

அனாசி அநாரச்செய்யு

The only member of this family found in Madras. A native of Tropical America frequently grown in gardens for its fruit.

Amaryllidaceae

Herbs with bulbous, tuberous or erect underground stems. Leaves arising from the upper part of the underground stem. Flowers few, usually in umbels, rarely in racemes. Perianth with 6 lobes, the lower tubular part cohering with the 3-celled inferior ovary. A corona sometimes present at the mouth of the perianth-tube. Stamens 6. Fruit a capsule. Seeds few or many.

- | | | |
|---|--|-------------|
| 1 | Underground part of stems bulbous | 2 |
| | Underground part of stems not bulbous | 3 |
| 2 | Filaments free | Crinum. |
| | Filaments united towards their bases by a petal-like membrane. | Pancratium. |
| 3 | Leaves narrow, pleated, not fleshy; flowers yellow | Curculigo. |
| | Leaves thick and fleshy; flowers not yellow | 4 |
| 4 | Leaves distinctly and sharply spine-pointed | Agave. |
| | Leaves not spine-pointed | Furcraea. |

Crinum, Linn.

Herbs with bulbous underground stems often produced into a long or short neck. Flowers large, arranged in umbels. Bracts 2, spathe-like. Perianth-tube long. Filaments of stamens free. Capsule bursting open irregularly.

Crinum defixum, Ker.

விஷ்ணுமங்கிள் Pl. XXXIV, B. கீசம்

Bulb ovoid, 2-3 in. in diameter, with a neck. Leaves linear, channelled down the face, about 2 ft. long, nearly 1 in. broad. Flower-bearing axis up to 2 ft. long. Bracts up to 2 in. long. Umbels 6- to 12-flowered. Perianth-tube nearly 3 in. long; lobes nearly as long, linear, pinkish-white. Filaments red. Fruit about 1 in. in diameter. Flowers October to December.

In rice fields and along the borders of tanks.

Pancratium, Linn.

Underground stems bulbous. Spathe large, membranous. Perianth funnel-shaped. Filaments united below into a thin petal-like cup.

Pancratium triflorum, Roxb.

Bulb without a neck, 1-2 in. in diameter. Leaves 4-8, erect, linear, about 1 foot long, $\frac{1}{2}$ -1 in. broad. Flower-bearing axis shorter than the leaves. Umbels 2- to 8-flowered. Perianth-tube slender at the insertion of the lobes, $1\frac{1}{2}$ -2 in. long; lobes linear, white, fragrant, $\frac{3}{4}$ -1 in. long. Staminal cup with bifid teeth between the filaments. Flowers in August.

Vandalur, on the summit of the hills. In the specimens collected by me there were only 2 flowers.

I collected a specimen of *Pancratium longiflorum*, Roxb. from the Marina opposite to the High Court in October, 1922. I have not since come across this species. The locality given for this species in Hooker's Flora of British India is "Central India and the Deccan Peninsula." Fischer mentions Vizagapatam District as its locality.

Curculigo, Gaertn.

Underground part of stem elongate. Flowers in racemes or spikes; the upper ones male, the lower ones bisexual. Stigma 3-cleft.

Curculigo orchiodes, Gaertn.

நிலப்பனங்கிழங்கு நெலாழி கட்டி

Leaves linear-lanceolate, folded into pleats lengthwise, sparsely hairy, up to $1\frac{1}{2}$ ft. long. Flower-bearing axis very short. Pedicels, bracts and ovary hidden inside the leaf-sheaths. Flowers bright yellow. Tubular part of perianth forming a slender beak for the ovary, $\frac{1}{2}$ -1 in. long. Perianth-segments hairy on the back, $\frac{1}{2}$ - $\frac{2}{3}$ in. long. Filaments very short. Ovules 6-8 in each cell. Capsules with a slender beak, $\frac{1}{2}$ in. long. Flowers September to January.

Guindy Park. Vandalur.

Agave, Linn.

ஆனைக்கற்றாழை கித்தூர

Leaves very thick and fleshy, clustered at the base of a long flower-bearing axis, with spiny teeth. Perianth tubular, funnel-shaped, persistent, 6 partite. Capsule tough, many-seeded. Seeds flattened.

Members of this genus are not indigenous to India and are supposed to have come from South America and the West Indies.

Leaves tufted, never less than 3 ft. in length sp.

Leaves in a globose rosette, never exceeding 3 ft. in length ... Wightii.

Agave sp. (near to Vera-Cruz, Mill.)

Leaves many, proceeding from a short thick axis which is hidden by their thickened bases, oblong-linear, covered with a bluish-white layer on both surfaces, dark green underneath the bluish-white layer, widest part, which is slightly above the middle, deeply trough-shaped, 6 ft. long and upwards, 8-12 in. at the widest part. Marginal prickles stout and black, $\frac{1}{2}$ -1 in. apart, those below the trough-like portion pointing downwards, those above the trough-like portion generally tending to point upwards; terminal spine dark-coloured, $\frac{7}{8}$ in. long. Flowers not seen.

Pallavaram, near Chromepet.

Agave Wightii, Drummond and Prain

Stem procumbent, ascending. Leaves many, forming a rosette, pale green tinged with ashy grey, upper surface more or less concave, up to 3 ft. long, less than $3\frac{1}{2}$ in. broad at the widest part which is above the middle. Marginal prickles light brown or colourless, $\frac{1}{2}$ in. apart.* Terminal spine brown (not pale), up to $\frac{1}{2}$ in. long. Flowers not seen.

Around Guindy Park.

Furcraea, Vent.

General appearance and habitat same as *Agave*. Terminal spine absent from the leaf though the tip is rolled inwards. Flowers bell-shaped. Segments of perianth broadly ovate. Filaments dilated at their bases, not doubled back within the bud as in *Agave*.

This is a South American genus.

Furcraea gigantea, Vent.

Leaves many, sharply ascending from a short trunk, forming a compact tuft, obovate-lanceolate, bright green, 4-6 ft. long and upwards, widest part, which is below the middle, about 8 in. broad and $\frac{3}{4}$ in. thick, not constricted above the base; apex forming a blunt acumen $\frac{1}{2}$ in. long. Marginal prickles weak, few and far between, occasionally nearly absent, pale below, rust-coloured above. Flowers disposed on the numerous subsidiary branches of a main flowering-stem which may be up to 20 ft. high. Bulbils numerous, disposed with the flowers. Pedicels $\frac{2}{5}$ in. long. Tubular part of perianth 1 in. long; lobes yellowish-green, having an agreeable scent, the inner 3 broader than the outer. Filaments dilated and thickened at the base, $\frac{1}{2}$ in. long. Style thickened just above the perianth-tube, narrowing towards the apex. Flowers in November.

Planted in hedges. Lady Willingdon Club.

Dioscoriaceae

Climbing herbs with thick underground stems or tuberous roots. Leaves simple or palmately compound. Flowers small, unisexual, arranged in spikes or racemes, male and female spikes on the same plant or on different plants. Perianth with 6 teeth or lobes. Stamens 6, all perfect, or 3 of them sometimes reduced to staminodes or altogether absent. Perianth-segments smaller in female than in the male. Ovary inferior, 3-celled. Ovules 2 in each cell. Styles 3, very short. Fruit a 3-valved capsule, laterally flattened.

Dioscoria, Linn.

పెండలము

Characters same as those of the family.

Dioscoria pentaphylla, Linn.

Root-tubers very long. Bulbs often borne on the axils of leaves. Leaves alternate, with 3-5 leaflets. Leaflets variable in size and shape, elliptic-oblong, tipped with a sharp point, 2-5 in. long. Male flowers pale greenish, fragrant, arranged in racemes. Stamens 3 alternating with 3 staminodes. Female flowers in hanging racemes up to 6 in. long. Capsule oblong, nearly 1 in. long, somewhat winged. Flowers in November. Fruit ripening in February.

Vandalur Hills.

Liliaceae

Herbs or rarely woody plants. Perianth free from the 3-celled ovary, consisting of 6 segments coloured alike, arranged in two series. Stamens 6. Ovules 2 or more in each cell. Fruit a capsule or a berry.

- | | | | | | | |
|---|-----|-----|-----|-----|-----|---------------|
| 1 Climbing plants | ... | ... | ... | ... | ... | 2 |
| Non-climbing plants | ... | ... | ... | ... | ... | 3 |
| 2 Leaves scaly, what appear to be linear leaves being modified branches | ... | ... | ... | ... | ... | Asparagus. |
| Leaves green, with tendril-like tips | ... | ... | ... | ... | ... | Gloriosa. |
| 3 Leaves very thick, tough or fleshy | ... | ... | ... | ... | ... | 4 |
| Leaves not thick, neither tough nor fleshy | ... | ... | ... | ... | ... | 5 |
| 4 Leaves tough, their margins not spiny | ... | ... | ... | ... | ... | Sansevieria. |
| Leaves fleshy, their margins spiny | ... | ... | ... | ... | ... | Aloe. |
| 5 Flowers arranged like a corymb | ... | ... | ... | ... | ... | Iphigenia. |
| Flowers arranged in racemes | ... | ... | ... | ... | ... | 6 |
| 6 Herbs with bulbous underground stems | ... | ... | ... | ... | ... | 7 |
| Herbs without bulbous underground stems | ... | ... | ... | ... | ... | Chlorophytum. |
| 7 Flowers distant on the raceme, appearing before the leaves; seeds flattened | ... | ... | ... | ... | ... | Urginea. |
| Flowers close together on the raceme, appearing with the leaves; seeds round | ... | ... | ... | ... | ... | Scilla. |

Asparagus, Linn.

Climbing shrubs with thick underground stems. What appear to be narrow thread-like leaves are really small branches acting as leaves (cladodes); they are arranged in clusters in the axils of little scales which are the true leaves. Flowers small, carried on jointed stalks. Fruit a berry.

Asparagus racemosus, Willd.

தண்ணீர்விட்டான் கிழங்கு Pl. XXXIV, C. வல்லுக்காய், பிள்ளைச்சர

A climbing much-branched spiny shrub. Roots tuberous. Cladodes up to 1 in. long. Flowers small, white, arranged in racemes 1-3 in. long. Perianth-segments spreading. Berry $\frac{1}{4}$ in. in diameter. Flowers in the rainy months.

In scrub jungle at Pallavaram and Vandalur Hills. Also found at Adyar.

The tuberous roots are largely used in Indian medicine.

Gloriosa, Linn.

Climbing herbs with tuberous underground stems. Leaves having tendril-like tips. Flowers large, showy, standing singly in the axils of leaves. Margins of perianth-segments undulate. Ovules many. Fruit a capsule.

Gloriosa superba, Linn. The Glory Lily

கலப்பைக்கிழங்கு Pl. XXXIV, D. அருவிநாடி

A climbing herb. Tubers cylindrical, simple or forked, white. Leaves ovate-lanceolate, tips ending in tendril-like spirals, parallel-nerved, not stalked, with cordate bases, not hairy, 3-6 in. long. Flowers large and handsome, on long stalks. Perianth-segments $2\frac{1}{2}$ in. long, scarlet and yellow. Capsule $1\frac{3}{4}$ in. long. Flowers October to December.

Avadi. Vandalur. Ennur. Adyar. The tuber has poisonous properties. It is used in medicine.

Sansevieria, Thunb.

சாக

Stout herbs. Leaves narrow, flat or cylindrical, tough or fleshy. Flowers in racemes. Perianth-tube fairly long; lobes narrow. Stamens attached to the perianth-lobes. Ovary free from the perianth-tube. Ovules one in each cell. Fruit tough, not breaking open.

Sansevieria Roxburghiana, Schult. Bowstring Hemp

மருள் Pl. XXXIV, A.

Stem very short. A creeping underground axis present. Leaves fleshy, semi-cylindrical, upper surface channelled, tapering to a point at apex, green with black bands, 2 ft. long. Flowering axis over 2 ft. long. Flowers about 4 in a cluster, pale green, about $\frac{1}{2}$ in. in length. Flowers July to September.

Avadi. Ennur. Vandalur. Long Tank. A fibre of good quality is extracted from the fleshy leaves. The roots and young shoots are used in medicine.

Aloe, Linn

Leaves fleshy, forming a rosette on the extremity of the short stem, usually spiny on the margins. Flowers in spikes. Perianth-segments united into a cylindrical tube, their tips usually free. Fruit a membranous capsule.

Aloe vera, Linn. The Barbados Aloe

Stem short. Leaves very thick and succulent, densely crowded, broad at the base, narrowed towards the blunt apex, pale green, covered with a waxy bloom, having small spine on the margins. Flowering axis 2-3 ft. long. Perianth reddish-yellow, cylindrical, 1 in. long. Flowers October to December.

Frequently grown in gardens. A native of the Mediterranean region. It has run wild in many places as at Ennur and the jungle at Pallavaram. The leaves are used in medicine.

Iphigenia, Kunth

Herbs with small roundish underground stems covered with sheaths. Perianth 6-partite, spreading, soon falling away. Ovules numerous. Styles 3. Fruit a capsule splitting along the back.

Iphigenia indica, Kunth

Corm up to $\frac{3}{4}$ in. in diameter. Stems 3-10 in. high. Leaves linear, with sheathing bases, getting gradually smaller upwards, with obscure nerves, 6-8 in. long. Perianth purple; segments narrow. Capsule oblong-ellipsoidal, $\frac{1}{2}$ in. long. Flowers in November and December.

Guindy Park.

Chlorophytum, Ker.

Roots usually thick and fleshy. Leaves forming a tuft. Perianth-segments not united, white. Ovary globose, with 4 or more ovules in each cell. Fruit a capsule.

Chlorophytum tuberosum, Baker

Root-fibres long, tuber-like. Leaves sessile, gradually tapering towards the tip, 8-24 in. long, margins usually crisped. Flower-bearing axis longer than the leaves. Pedicels jointed at or below the middle. Perianth-segments 7-nerved, over $\frac{1}{2}$ in. long. Capsule up to $\frac{1}{2}$ in. long, 4- to 6-seeded. Flowers in August.

Vandalur Hills, on the summit.

Urginea, Stienh.

Herbs having underground bulbs. Leaves starting from the apex of the bulb. Flowers in racemes on a long leafless axis, appearing before the leaves. Perianth bell-shaped, not spreading. Ovules many. Style tapering towards the base.

Urginea coromandeliana, Hook.

Bulb $1\frac{1}{2}$ in. in diameter. Leaves narrow, 6-8 in. long. Flowering axis 1- $1\frac{1}{2}$ ft. in length. Flowers dull green and purplish. Perianth-segments about $\frac{1}{3}$ in. long. Style very short. Capsule ellipsoidal, under $\frac{1}{2}$ in. long. Flowers in the rainy months.

Ennur, in sandy places.

Scilla, Linn.

Herbs with bulbs under the ground. Leaves arising from the apex of the bulb. Flowers in racemes on a leafless axis. Ovules 2 in each cell.

Scilla indica, Baker

Bulb 1- $1\frac{1}{2}$ in. in diameter. Leaves appearing with the flowers, lanceolate, narrowing to the sheathing petioles, blotched with purplish-black spots on the upper surface, 3-6 in. long. Flowering axis 2-5 in. long. Flowers greenish-purple, arranged in dense racemes. Perianth-segments less than $\frac{1}{4}$ in. long. Capsule roundish, $1\frac{1}{4}$ in. in diameter. Flowers in August and September.

In scrub jungle and in grassy places in the city. The variety found on hills has much broader leaves.

Pontederiaceae

Fresh-water or marsh herbs, erect or floating. Flowers in racemes or spikes at the ends of 1-leaved branches. Perianth of 6 segments, all coloured alike. Stamens 6. Ovary 3-celled, free from the perianth. Ovules many. Fruit a capsule.

Base of leaf dilated into a bladder; perianth tubular below ... *Eichhornia*.

Base of leaf not dilated into a bladder; perianth-segments ...

free *Monochoria*.

Eichhornia, Kunth

Water-plants rooting in mud or floating and rooting at the nodes. Leaves erect or floating, obovate, circular or cordate. Flowers in spike-like racemes from the sheath of the leaf. Perianth funnel-shaped, segments often unequal. Stamens irregularly inserted. Ovary 3-celled. Ovules numerous. Capsule with numerous ovoid many-ribbed seeds.

This is an American genus.

Eichhornia crassipes, Solms (*Eichhornia speciosa*, Kunth). The Water Hyacinth

Pl. XXXVI, A.

Stems profusely rooting at the nodes. Leaves arranged in a rosette, spoon- or paddle-shaped, apex rounded, 2-8 in. in diameter. Petioles up to 10 in. long, swollen into green bladders. Flower-bearing axis proceeding from the centre of the rosette, 6-10 in. long. Flowers violet-blue, $1-1\frac{1}{3}$ in. long. Flowers in the rainy months.

In ponds and tanks in the city. Abundant in the Spur Tank. This weed has become a pest in many parts of this country and is very difficult to eradicate.

Monochoria, Presl.

Fresh-water and marsh herbs. Underground part of stem short or creeping. Leaves single, at the top of stems that rise above the surface of water. One stamen larger than the others, its filament provided with a small process.

Underground part of stem long; basal lobes of leaves prolonged downwards or outwards; flowers on fairly long stalks arranged more or less in an umbel, the lower or outer flowers opening first hastaefolia.

Underground part of stem short; leaves ovate; flowers on short stalks arranged as in a raceme but the upper flowers opening first vaginalis.

Monochoria hastaefolia, Presl.

Pl. XXXVI, B.

Underground part of stem spongy, rooting below. Leaves acute or acuminate at apex, nerves very close, smooth and glossy, 3-8 in. long. Stalks of flower-bearing leaves swollen, containing the short stalk of the flowering axis. Flowers violet-blue, showy. Perianth-segments twisting in cork-screw fashion round the fruit when withering, $\frac{2}{3}$ in. long. Large anther blue, the smaller ones yellow. Capsule about $\frac{1}{4}$ in. in diameter. Flowers August to January.

Very common on the margins of tanks and ponds.

Monochoria vaginalis, Presl.

Underground stem short and spongy. Leaves ovate-cordate, acute or acuminate, nerves not very close nor very numerous, 2-6 in. long. Flowers arising from the sheath-like part inside the stalks of leaves. Pedicels less than $\frac{1}{4}$ in. long. Flowers blue, $\frac{3}{4}$ in. across. Flowers in the rainy and cold weather.

Very common in tanks and pools.

Xyridaceae

Erect herbs. Leaves narrow, sheathing the base of a flower-bearing axis. Flowers packed into heads, in the axils of scale-like bracts. Sepals 3, chaff-like, the 2 lateral ones boat-shaped and the third larger and covering the corolla in the bud. Petals 3, yellow. Fertile stamens 3. Undeveloped stamens 3. Ovary 1-celled. Ovules many. Fruit a capsule.

Xyris, Linn.

Characters same as those of the family.

Xyris pauciflora, Willd.

Leaves narrowly linear, as long as or a little longer than the flower-bearing axis (3-8 in. long). Spike globose, $\frac{1}{4}$ - $\frac{1}{2}$ in. long. Bracts thin, pale, circular-obovate. Lateral sepals oblanceolate, acuminate. Flowers January to March.

Ennur, in marshy places.

Commelinaceae

Herbs. Leaves entire, with sheathing bases and parallel nerves. Flowers arranged in cymes or in panicles. Sepals 3. Petals 3, soon decaying or falling, sometimes united into a tube at the base. Stamens 6, all perfect or 1-3 undeveloped. Ovary 3- or 2-celled. Fruit a capsule or not breaking open.

1	Stamens 6 perfect	..	...	...	...	...	Cyanotis.
	Stamens 3 perfect, 1-3 undeveloped	...	...	...	...	2	
2	Petals unequal	...	...	...	...	...	Commelina.
	Petals equal	...	...	...	...	...	Aneilema.

Cyanotis, Don.

Creeping or prostrate herbs. Flowers in clusters in the axils of bracts. Filaments bearded. Ovary 3-celled. Ovules 2 in each cell. Fruit a capsule.

1	Flowers standing above the leaf-sheaths in the axils of bracteoles which are arranged in 2 series	...	...	2
	Flowers enclosed in the sheaths of leaves	...	...	axillaris.
2	Clothed with cobweb-like or woolly hairs	...	...	fasciculata.
	Not clothed with cobweb-like or woolly hairs	...	...	cristata.

Cyanotis axillaris, Schultes

வழுக்கைப்புல் Pl. XXXV, A.

A glabrous annual herb. Branches prostrate or somewhat erect. Leaves linear, acute or acuminate, glabrous, 2-6 in. long. Flowers violet-blue, clustered in the inflated leaf-sheaths. Flowers October to December.

A very common weed of rice fields and damp places.

Cyanotis fasciculata, Schultes var. *rosea*

A small herb. Branches spreading. Leaves with cobweb-like hairs on both surfaces, rather fleshy, lanceolate, $\frac{3}{4}$ -2 in. long. Cymes nearly $\frac{1}{2}$ in. long, either in the axils of leaves or at the ends of branches. Petals rose-purple. Flowers in November and December.

In wet places at the foot of the Vandalur Hills.

Cyanotis cristata, Schultes

Stem creeping and rooting below and then ascending. Leaves ovate-oblong, not stalked, glabrous, margins fringed with minute hairs, $1\frac{1}{4}$ - $2\frac{1}{2}$ in. long. Cymes recurved, $\frac{1}{2}$ -1 in. long, on stalks up to 4 in. long. In some forms the stalks are altogether absent. Bracts looking like leaves, $\frac{2}{3}$ - $1\frac{1}{2}$ in. long. Bracteoles $\frac{1}{2}$ in. long, few or many. Flowers October to December.

Chetpat. Adyar. Guindy.

Commelina, Linn.

Flowers emerging from spathes at the ends of branches. Sepals slightly unequal. Petals blue, 2 of them having stalks and much larger than the third. Fertile stamens 3; imperfect stamens 3, with cross-shaped anthers. Ovary 3- or 2-celled. Ovules 1 or 2 in each cell.

1 Ovary 2-celled ...	...	...	...	...	...	...	attenuata.
Ovary 3-celled ...	...	...	...	...	...	...	2
2 Ovary with 1 ovule in each cell	...	...	...	...	...	...	paleata.
Ovary with 2 ovules in each of 2 of the cells and one	...	...	...	...	...	...	3
ovule in the third cell	...	...	...	...	...	...	3
3 Spathe top-shaped	...	...	...	...	...	...	benghalensis.
Spathe not top-shaped but folded along the midrib	...	...	...	...	...	...	4
4 Spathes stalked	...	...	...	...	...	...	nudiflora.
Spathes not stalked	...	...	...	...	...	...	subulata.

Commelina attenuata, Koen.

A much-branched slender herb. Leaves sessile, linear-lanceolate, $1\frac{1}{4}$ -3 in. long. Spathes 1 - $1\frac{1}{2}$ in. long. Flowers small. Capsule not constricted in the middle, 2- or 4-seeded. Flowers in December and January.

Adyar, Pallavaram.

Commelina paleata, Hassk.

Pl. XXXV, C.

A stout glabrous much-branched herb. Leaves broadly lanceolate, acuminate, 2-6 in. long; sheaths $\frac{3}{4}$ -1 in. long. Spathes acuminate, $\frac{3}{4}$ - $1\frac{1}{4}$ in. long. Capsule 3-seeded. Flowers October to March.

A very common weed found almost everywhere.

Commelina benghalensis, Linn.

காணவாழை Pl. XXXV, B. పెన్నమొద్ద

A dichotomously branched herb creeping and rooting below. Leaves ovate or oblong, obtuse, carried on short stalks, their two halves unequal, covered on both sides with soft short hairs, 1-3 in. long. Bracts (spathes) 1-3 together, funnel-shaped or top-shaped. Two of the cells of the ovary having 2 ovules each and 1 cell having 1 ovule. Capsule 5-seeded. Flowers in the rainy weather.

A very common weed. Sometimes underground branches grow from the lower nodes and bear on them small white flowers which mature into 1- or 2-seeded fruits.

Commelina nudiflora, Linn.

A prostrate herb. Leaves sessile, lanceolate, acute or acuminate, $1\frac{1}{2}$ -3 in. long; sheaths $\frac{3}{4}$ in. long. Spathes ovate or ovate-lanceolate, $\frac{3}{4}$ - $1\frac{1}{4}$ in. long. Cymes usually 2-flowered. Flowers about $1\frac{1}{2}$ in. across. Two of the petals bright blue, the third pale blue or white. Two of the cells of the ovary 2-ovuled, the third 1-ovuled. Capsule oblong, acuminate, 5-seeded. Flowers in January and February.

Adyar.

Commelina subulata, Roth

An erect herb with glabrous stems, $\frac{1}{2}$ -1 foot high. Leaves linear, 1-3 in. long. Flowers at the ends of branches. Spathes about $\frac{1}{4}$ in. long, acute, curved. Flowers small, purple. Capsule small, 5-seeded. Flowers November to January.

Ennur, in sandy places.

Aneilema, R.Br.

Flowers in panicles in the axils or at the ends of branches. Bracts not enlarged as in *Commelina*. Sepals thin. Petals 3, obovate, equal. Perfect stamens 2 or 3; imperfect ones 2-4. Ovary 2- or 3-celled. Ovules 1 or more in each cell. Fruit a capsule.

- | | | | | | |
|---|---|-----|-----|-----|-------------|
| 1 | Cells of the ovary with 1 ovule in each | ... | ... | ... | vaginatum. |
| | Cells of ovary with more than 1 ovule in each | ... | ... | 2 | |
| 2 | Cells of ovary with 2 ovules in each | ... | ... | ... | nudiflorum. |
| | Cells of ovary with 3 to many ovules in each | ... | ... | ... | spiratum. |

Aneilema vaginatum, R.Br.

Branches more or less erect. Leaves linear, acuminate, glabrous, 3-8 in. long. Flowers usually 3 together at the ends of slender branches. Petals round, blue. Stamens 2 perfect, 3 or 4 sterile. Filaments of fertile stamens bearded. Capsule with a sharp point at the tip. Flowers in the rainy weather.

Common in wet places.

Aneilema nudiflorum, R.Br.

Pl. XXXV, D.

Stem often rooting at the nodes. Leaves linear-lanceolate, acute or acuminate, 2-5 in. long. Flowers in corymbs at the ends of branches. Petals blue or purple. Stamens 2 perfect, 2-4 imperfect. Filaments of fertile ones bearded. Capsule rounded, slightly 3-angled, with a pointed tip at the apex. Flowers in the rainy weather.

A common weed.

Aneilema spiratum, R.Br.

A small annual herb branched from the base. Leaves linear-lanceolate, clasping the stem, glabrous, $\frac{1}{2}$ - $1\frac{1}{2}$ in. long. Flowers about $\frac{1}{3}$ in. across, arranged in dichotomously branched panicles at the ends of branches. Petals blue. Perfect stamens 3, blue. Filaments bearded. Undeveloped stamens 3. Capsule rounded, 3-angled, with a sharp point at the apex. Flowers October to March.

Common in wet places. Abundant at Covelong.

Palmaceae

Straight single-stemmed plants with a crown of leaves at the top. Leaves large, clasping the stem by their sheathing bases, split pinnately (feather type) or palmately (fan type). Flowers arranged in a branched spike enclosed in a spathe; male and female on the same plant or on different plants. Sepals and petals 3 each. Stamens 6. Ovary 3-celled. Fruit a 1-celled drupe or berry.

- | | | |
|---|--|-----------|
| 1 | Fruit covered with shiny imbricating scales; stem | |
| | armed with prickles | Calamus. |
| | Fruit not covered with scales; stem not armed with | |
| | prickles | 2 |
| 2 | Leaves feather-like | Phoenix. |
| | Leaves fan-like | Borassus. |

Calamus, Linn.

பிளம்ப

பிளம்ப

Climbing palms. Leaves pinnately cut. Spikes much-branched. Female flowers having undeveloped stamens joined together into a cup. Fruit globose or ellipsoid, furnished with a beak on the tip.

Calamus Rotang, Linn. Common Rattan Cane

A thorny climbing cane. Leaves 2-3 ft. long. Leaflets armed with spines on the margins and sparsely along the midrib beneath, 4-10 in. long. Fruit globose, light brown, $\frac{2}{3}$ in. in diameter. Flowers during the rains.

Occasionally met with in jungly places. Near Mambalam Tank. Vandalur. Tiruvanniyur.

This yields the rattan cane used in making chairs, mats and baskets. The fruit is edible and is considered a favourite of Ganapathi by the Hindus.

Phoenix, Linn.

Tall or short palms, the entire stem or the upper part covered with the stiff bases of the leaf-stalks. Leaves pinnate. Midrib absent in leaflets. Male and female flowers on separate plants. Fruit a berry.

Stem up to 50 ft. high sylvestris.

Stem not more than 3 ft. high humilis.

Phoenix sylvestris, Roxb. The Wild Date Palm

நச்சுமரம்

சிறு

Stem covered by the bases of the fallen leaves or marked by their scars. Leaves 4-7 ft. long. Leaflets glabrous, 6-18 in. long, the lowest ones converted into spines. Flowers small, arranged in panicles. Fruit oblong, orange-yellow, edible, about 1 in. long. Flowers in January and February.

The leaves are used in making mats, brooms, baskets and nets for fishing. A kind of toddy is obtained by tapping the upper part of the trunk.

Phoenix humilis. Royle. The Hill Date Palm

காட்டிச்சுமரம்

Pl. XXXVI, C.

சீண்டாந்த

Stem not more than 3 ft. high. Leaves 3-5 ft. long. Leaflets glabrous, 10-20 in. long, the lowest ones converted into spines. Flowers in branched cymes in the axils of leaves. Fruit oblong, black, edible, $\frac{1}{2}$ in. long. Flowers in February and March. Fruit ripens in May and June.

Hills of Pallavaram and Vandalur. The leaves are used in making mats and baskets.

Borassus, Linn.

Leaves at the ends of tall stems, fan-shaped, ends cut into numerous segments. Leaf-stalks spiny on the edges. Male and female flowers on separate plants. Male flowers on stout cylindrical branches, densely clothed with imbricating bracts and appearing to be sunk in the cylindrical branches of the inflorescence; stamens 6; sterile ovary present. Female flowers larger, scattered on sparingly branched inflorescences; perianth enlarging in fruit; sterile stamens 6-9; ovary 3-to 4-celled. Fruit a large drupe.

Borassus flabellifer, Linn. The Palmyra Palm

பனைமரம் தாபிச்செட்டி

A tall palm. Leaves up to 3 ft. in diameter. Leaf-stalks 2-4 ft. long. Inflorescence very large. Male flowers small. Female flowers 1 in. in diameter. Drupe brown, 6 in. in diameter. Seeds oblong, 3-lobed at the top.

Cultivated and self-sown. The wood is hard and durable and is used for rafters and posts. The leaves are used in thatching houses, for making mats and fans and also for writing on. The juice of the unripe fruit is eaten. A kind of toddy is obtained by the fermentation of the juice from the cut ends of the flower-stalks.

The following palms are commonly met with in Madras:—

Cocos nucifera, Linn. The Coconut Palm

தென்னேமரம் கீழ்ச்செட்டி

Trunk with a number of horizontal rings, thickened and with a huge mass of root-lets below, growing up to 60 ft. high. Leaves large, pinnate, 6-12 ft. long. Leaflets up to 2 ft. long. Spadix branched drooping when in fruit, up to 4 ft. long, with female flowers at the base. Fruit large, sub-globose or obovoid, 8-12 in. long.

Extensively cultivated. The tree is considered sacred by the Hindus and the kernel of the fruit is offered to God. The tree is put to a variety of uses. The kernel is eaten raw or in curries. The oil pressed from the dried kernels is an important article of commerce and is much used in cooking. The fibrous covering of the fruit yields coir. The inflorescence is tapped for toddy.

Areca Catechu, Linn. The Betel-nut Palm

பாக்குமரம் பிச்சுச்செட்டி

An elegant slender-stemmed palm. Trunk green at the top, with a large number of horizontal rings, growing up to 60 or 70 ft. high. Leaves pinnate, 4-6 ft. long. Leaflets shiny, 1-2 ft. long, the upper ones united together. Spadix branched. Fruit scarlet when fully ripe, 1½-2 in. long.

Often grown in gardens. Requires regular watering. The nut "Supari" is used in chewing.

Oreodoxa regia, H.B. & K. The Royal Palm of Cuba

A handsome pinnate-leaved palm with smooth cylindrical trunk.

Caryota urens, Linn. The Fish-tail Palm

கருந்தல் பனை

ಜೆಲಾಕ್ ಪಟ್ಟ

A tall palm. Leaves large, twice pinnate. Leaflets triangular, obliquely truncate, irregularly serrate on the truncate margin, the upper margin produced into a tail, shiny, 4-8 in. long. Flowers arranged in a dense drooping spadix up to 10 ft. long, the branches of which are of equal lengths.

A native of the mountainous districts of the Presidency. It does not flower until it is fully grown and after putting forth flowers for a few years it dies. The leaves yield a good fibre. The pith furnishes a kind of sago.

Livistonia chinensis, R.Br.

Trunk 20-30 ft. high. Leaves large, fan-shaped, carried on stalks armed with short recurved spines. Flowers white. Fruit a dull blue drupe. A native of China and Japan.

Pandanaceae

Trees or shrubs. Stem often supported by adventitious roots and appearing as if standing on stilts. Leaves arranged in spirals, with sheathing bases, narrow, acuminate, having spines along the margins and the midrib. Flowers small, crowded together and enclosed within spathes. Male and female flowers on separate plants. Perianth absent. Bracts and bracteoles absent. Stamens numerous in male flowers. Ovary 1-celled, united with the contiguous ones or quite distinct. Fruit consisting of numerous obconic drupes crowned by the hardened style. Seeds single in each drupe.

Pandanus, Linn. The Screw-Pines

தாழை

ಮೂಗಿಲಿ

Male flowers having a number of spathes each enclosing numerous stamens. Female flowers grouped into a single cluster and protected by leafy spathes. Fruit a cylindrical mass consisting of a number of carpels united together.

Pandanus tectorius, Soland. (*Pandanus fascicularis*, Lamk.)

Pl. XXXVI, D.

A large shrub. Stem supported by roots. Male flowers arranged in numerous cylindrical spikes enclosed by long white fragrant spathes. Female flowers arranged in a spike. Carpels united together in small groups of 5-10. Fruit cylindrical or globose resembling a pine-apple in appearance but woody in texture, formed by the union of the carpels, red or yellow when ripe, 6-10 in. long. Flowers in the rainy weather.

Forming dense thickets at Adyar. Red Hills.

Typhaceae

Tall aquatic or marsh herbs. Leaves linear. Flowers minute, densely packed into cylindrical (or globose) spikes, either male or female. Perianth of thin scales or slender hairs. Stamens 1-7 in male flowers. Ovary 1- or 2-celled. Cells 1-ovuled. Fruit very minute.

Typha, Linn.

Marsh-herbs. Leaves erect, spongy. Flowers small, in very densely packed spikes, often intermixed with hairs having dilated tips. Perianth of slender hairs present or absent. Stamens 1 or more. Connective part of anther thickened at the top. Ovary often reduced to a club-shaped hair, long-stalked, narrowed into a very slender style.

Typha angustata, Bory & Chaub.

Pl. XXXVII, B. 253

Stem 5-10 ft. high. Leaves semi-cylindrical, $\frac{3}{4}$ -1 in. long. Spikes $\frac{1}{3}$ - $\frac{7}{8}$ in. in diameter. Female flowers among club-shaped hairs that represent sterile flowers. Bracteoles present. Flowers in the rainy weather and after.

Kilpauk, near the water works. Red Hills, on the sides of the outlet channels. A few years back it was abundant in the Spur Tank, but it has now disappeared from that locality. The reeds are useful in making mats, screens and umbrellas but this is not done locally.

Araceae

Herbs with short underground stems, sometimes stemless and sometimes climbing. Flowers usually unisexual, not carried on stalks, arranged on a fleshy axis (spadix) and more or less enclosed by a large bract (spathe). Male flowers disposed towards the top and female flowers towards the bottom of the spadix with neuters between them and sometimes also above the males; neuters sometimes absent. Perianth absent. Fruit of many small berries.

- | | | | |
|--|-----|-----|-----------------|
| 1 Stemless plants floating on the surface of water | ... | ... | Pistia. |
| Fleshy underground stems present; land-plants | ... | ... | 2 |
| 2 Flowers appearing before the leaves; leaves single, 3-partite, | | | |
| each part divided into many segments | ... | ... | Amorphophallus. |
| Flowers and leaves appearing together | ... | ... | 3 |
| 3 Ovules 1 or 2 in each ovary | ... | ... | Typhonium. |
| Ovules many in each ovary | ... | ... | Colocasia. |

Pistia, Linn.

Floating gregarious herbs. Leaves arranged in a close spiral forming a cup, obovate to wedge-shaped. Spathe small, tubular below, open above. Male inflorescence consisting of a whorl of a few anthers below the apex of the spadix with a whorl of minute neuters below it. Female inflorescence consisting of a solitary, oblong, 1-celled ovary adherent to the spadix for nearly its whole length. Style and stigma present. Ovules many. Fruit ovoid, bursting irregularly.

Pistia Stratiotes, Linn.

ஆகாசத் தாமரை

Pl. XXXVII, D.

అంజరదామర

Roots forming fibrous tufts. Leaves rounded or shallowly notched at apex, covered densely with soft minute hairs on both surfaces, 1-2½ in. long; nerves 3-5, prominent on the under-surface. Spathe obliquely bell-shaped, white, closed below, contracted about the middle, dilated above. Flowers after the rains.

In ponds and tanks. Occasionally in wells.

Amorphophallus, Blume

Underground stems large. Leaves single, 3-partite, pinnately cut into many segments. Flowers appearing before the leaves. Inflorescence cylindrical, dense-flowered. Neuter flowers absent. Male inflorescence consisting of 2-4 anthers. Ovaries 1- to 4-celled. Ovules one in each cell.

Amorphophallus campanulatus, Blume

கருணை கிழங்கு

కంఠ

Leaves appearing long after the flowers, 1-3 ft. broad; segments spreading, oblong or obovate, with a sharp point at apex, glabrous, 2-4 in. long. Petioles green with paler blotches, 1-3 ft. long. Spathe bell-shaped, pointed, strongly and closely veined, with recurved wavy and crisped margins, outside greenish-pink with pale blotches, 6-10 in. broad. Spadix as long as the spathe, with a stout dark purple appendage at the top. Anthers densely crowded, pale yellow. Ovaries densely crowded. Style ½ in. long. Stigma large, 2- or 3-lobed. Berries obovoid, red, 2- or 3-seeded.

Vandalur, at the foot of the hills. I have not collected the inflorescence. I identified the specimen by comparing it with those in the Calcutta herbarium. The underground stems are largely used for curries.

Typhonium, Schott

Herbs with underground tubers. Leaves usually 3- to 5-lobed. Tube of spathe short, rolled up longitudinally, persistent, upper part falling away. Neuter flowers present between the male and female groups and sometimes below the males also. Appendage of spadix fairly long. Ovaries 1-celled. Ovules 1 or 2.

Tipponium divaricatum, Decne.

Pl. XXXVII, C.

Tuber curved, 1-1½ in. in diameter. Leaves shaped like an arrow-head at base but with the basal lobes pointing outwards at right angles or sometimes downwards, acute, glabrous, 2-4 in. long; leaf-stalks 4-6 in. long. Spathe with reddish-brown markings on the inside, 4 in. long; tube of spathe round and with a horizontal purplish band at the constricted part below; the expanded part broadly ovate at the top. Spadix 2½ in. long. Neuter flowers above the female inflorescence short, almost erect, linear. Appendage purple. Flowers in November and December.

In shady and grassy places. The local form differs from Wight's specimen in the spathe not being twisted in a spiral at apex and also in the appendage of the spadix not tapering to a point but remaining almost cylindrical. Wight's specimens were collected in Malabar.

Colocasia, Linn.

Flowers appearing with the leaves. Leaves ovate, cordate. Spathe carried on a stout stalk; tubular part thick, growing with and remaining on the fruit; mouth constricted; the upper part erect and falling away. Spadix shorter than the spathe. Neuter flowers present between male and female flowers. Ovaries 1-celled. Ovules many.

Colocasia antiquorum, Schott

கேசம்பு கேசு

Leaves large, ovate, with 2 broad triangular basal lobes, glabrous, 6-16 in. long; leaf-stalks stout, of varying lengths, green or violet. Spathe pale yellow, acuminate, 8-11 in. long.

Cultivated and found growing wild. All parts of the plant are eaten but chiefly the tubers.

Lemnaceae

Minute plants destitute of distinct stem and leaves and often having small hair-like roots hanging from the lower surface. Flowers either male or female, proceeding from the edge or upper surface. Perianth absent. Stamens 1 or 2 in male flowers. Female flowers having a 1-celled ovary with 1-7 ovules.

Plants flat; with one or more roots; flowers present in

clefts in the margins of leaves Lemna.

Plants minute, like grains of sand, root-less, bearing flowers

on the upper surface Wolffia.

Lemna, Linn. Duckweed

One or more minute hair-like roots proceeding from beneath the plant. Flowers produced from a cleft in the margin of the plant, usually 3 together surrounded by a bract; 2 male, represented by a stamen only; the other female, represented by an ovary with 1-7 ovules.

Lemna paucicostata, Hegelm

Plant obovate or obovate-oblong, somewhat flat on both surfaces, the two halves unequal, $\frac{1}{4}$ in. long. Young plants attached to the old ones. Roots single.

Appearing after the rains. Floating on ponds and tanks. I have not seen the flowers.

Wolffia, Horkel

Plants like grains of sand. Roots absent. Flowers inserted in a groove on the upper surface of the plant. Spathe absent.

Wolffia Michellii, Schleid. (*Wolffia arrhiza*, Horkel)

A minute floating plant, convex on both surfaces, covering the water like a green scum. This species is the smallest among flowering plants. Appearing after the rains.

In ponds and tanks. I have not seen the flowers.

Alismaceae

Aquatic or marsh-herbs with scape-like stems. Leaves sheathing at their bases. Flowers 1- or 2-sexual. Sepals 3. Petals 3, soon falling. Stamens 6. Ovary composed of a number of 1-celled, 1-ovuled units. Fruit consisting of a number of achenes.

Limnophyton, Miquel

Perennial herbs with scape-like stems and abounding in milky juice. Leaves sagitate. Flowers either male or 2-sexual, arranged in whorls. Ovary made up of 15-20 independent units. Ovules 1 in each unit.

Limnophyton obtusifolium, Miquel

Pl. XXXVIII, A.

An erect aquatic herb. Leaves sagitate, tapering to a fine point at apex, with long basal lobes, 6-12 in. long, 4-8 in. broad. Leaf-stalks striated, channelled above, 1-3 ft. long. Panicle with a stout branching scape 2-4 ft. long. Flowers arranged in whorls on the branches of the panicle. The upper whorls mostly male; the lower whorls bisexual. Achenes obovoid, wrinkled, collected into a globose head $\frac{1}{2}$ - $\frac{3}{4}$ in. in diameter. Flowers in December and January.

In pools near Poonamallee.

Naiadaceae

Water-plants with creeping underground stems. Leaves with sheathing bases. Flowers inconspicuous, usually green, 2-sexual or sometimes 1-sexual. Perianth of 2-4 segments meeting by their edges or altogether absent. Stamens 1-6. Ovary consisting of 1-6 distinct units each 1-celled and having a single ovule. Fruit not breaking open.

1	Salt water plants; perianth absent ...	...	...	...	Ruppia.
	Fresh water plants; perianth present ...	...	...	...	2
2	Perianth-segments 4 ...	...	...	...	Potamogeton.
	Perianth-segments less than 4 ...	...	...	...	Aponogeton.

Ruppia, Linn.

Plants growing under salt water. Underground stem creeping. Leafy stem dichotomously branched. Leaves alternate or almost opposite, slender, very thin, with narrow sheaths. Flowers minute, 2-6 together within a leaf-sheath on an ultimately elongating peduncle. Perianth absent. Stamens 2. Anthers without filaments. Carpels 4. Ovules single in each carpel. Fruit of 4 distinct achenes carried on short stalks.

Ruppia rostellata, Koch

Stems tangled together into a mass. Leaves dull green, 2-4 in. long. Peduncles $\frac{1}{4}$ -1 in. long. Flowers 2 together inside the leaf-sheaths. Achenes beaked, forming an umbellate head, supported on stalks that elongate and become up to 1 in. in length.

In the Covelong lagoon. Occasionally found at Ennur. I have not collected flowering specimens of this plant.

Potamogeton, Linn.

Submerged water-plants with creeping underground stems. Stipules present. Flowers minute, arranged in spikes. Perianth of 4 green segments that meet by their edges and do not overlap. Stamens 4. Filaments absent. Ovary of 4 independent 1-celled units. Ovules 1 in each ovary. Fruit consisting of small drupes.

Upper leaves floating; the lower ones submerged, oblong or elliptic-lanceolate ... indicus.

Leaves all submerged, cut into numerous slender segments pectinatus.

Potamogeton indicus, Roxb.

Stem branched, its length depending on the depth of the water. Floating leaves glossy, many-nerved, carried on stalks of varying lengths, blade $2\frac{1}{2}$ -4 in. long; the submerged ones thin, up to 8 in. long. Spikes $1\frac{1}{2}$ in. long, carried on peduncles 1-2 in. long. Perianth-segments furnished with stalk-like parts. Fruit furnished with beaks at their apices. Flowers in October and November.

In tanks. Abundant in the Red Hills Tank and the outlet channels.

Potamogeton pectinatus, Linn.

Stem very slender, copiously branched, forming tassel-like masses when taken out of the water. Leaves cut into filament-like segments, 1-6 in. long. Spike including the peduncle 2-3 in. long. Flowers minute, green, arranged in a few whorls on the spike. Fruit with short straight beaks. Flowers in October and November.

Red Hills Tank.

Aponogeton, Linn.

Fresh-water herbs with underground stems. Leaves thin, oblong, floating or submerged. Flowers arranged in 1-sided spikes carried on a long axis. Perianth consisting of 1-3 segments or absent. Stamens 6. Ovaries 3 or 6. Ovules 2 or more in each carpel.

Aponogeton monostachyon, Linn.

Pl. XXXIII, D.

Leaves 3- to 5-nerved and having numerous cross nerves between them, $2\frac{1}{2}$ -8 in. long. Leaf-stalks varying in length with the depth of the water. Spikes 1-6 in. long. Flowers pink, white or pale blue. Perianth-segments 2. Anthers bluish-purple. Fruit of 3 follicles. Seeds 4-8. Flowers October to December.

In tanks and pools.

Eriocaulaceae

Marsh-herbs with reduced stems and a tuft of fibrous roots. Leaves narrow, grass-like, forming a cluster and sheathing the base of a central axis which bears dense heads of minute unisexual flowers each in the axil of a scale-like bract. Perianth chaffy, generally of 2 whorls consisting of 2 or 3 parts each. Stamens 6 or fewer, inserted on the corolla. Ovary 2- or 3-celled. Ovules 1 in each cell. Fruit a small capsule.

Eriocaulon, Linn. Hat-pin Flowers

Characters same as those of the family.

Anthers white; petals absent in female flowers Sieboldianum.

Anthers black; petals 3 in female flowers quinquangulare.

Eriocaulon Sieboldianum, Sieb. & Zucc.

Pl. XXXVIII, B.

A low stemless tufted annual about 4 in. high. Leaves linear, 1-2 in. long. Peduncles glabrous, 5-ribbed. Heads whitish, $\frac{1}{4}$ in. in diameter. Sepals in male flowers 3, united, 3-toothed at apex; in female flowers 2, not united. Flowers in January and February.

Ennur, in marshy places on the borders of the pond opposite to the railway station. Red Hills, in wet places.

Eriocaulon quinquangulare, Linn.

Leaves linear, 5- to 11-nerved, up to 4 in. long. Peduncles glabrous, 5-ribbed, up to 9 in. high. Heads grey or snow-white, $\frac{1}{4}$ in. in diameter. Sepals 3 in male and in female flowers, their tips pencil-shaped in the former and softly hairy in the latter. Flowers in March.

Vandalur, on the border of the tank.

Cyperaceae

Grass-like herbs with fibrous roots. Leaves 3-ranked, usually crowded at the base of the stem, their lower parts forming tubular sheaths, in some genera leaves altogether absent. Flowers having no perianth, 1- or 2-sexual, arranged each in the axil of a scale-like bract (glume), the latter crowded on axes (rhachillas) to form small shortened spikes (spikelets) which are disposed on a branched axis. Bristles or scales sometimes present underneath the ovary. Stamens 1-3. Ovary 1-celled. Ovules single. Stigmas 2 or 3. Fruit a nut.

- | | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-----|-----------------------|
| 1 | Glumes arranged in 2 ranks; bristles beneath the ovary | | | | | | | |
| | absent | ... | ... | ... | ... | ... | ... | 2 |
| | Glumes arranged in spirals; bristles beneath the ovary | | | | | | | |
| | often present | ... | ... | ... | ... | ... | ... | 6 |
| 2 | Style divided into 3 branches | ... | ... | ... | ... | ... | ... | 3 |
| | Style divided into 2 branches | ... | ... | ... | ... | ... | ... | 4 |
| 3 | Rhachilla of spikelets persisting | ... | ... | ... | ... | ... | ... | Cyperus, p. 305. |
| | Rhachilla of spikelets soon falling | ... | ... | ... | ... | ... | ... | Mariscus, p. 308. |
| 4 | Rhachilla of spikelets persisting | ... | ... | ... | ... | ... | ... | Kyllinga, p. 309. |
| | Rhachilla of spikelets soon falling | ... | ... | ... | ... | ... | ... | 5 |
| 5 | Nut compressed sideways | ... | ... | ... | ... | ... | ... | Pycneus, p. 309. |
| | Nut compressed from above downwards | ... | ... | ... | ... | ... | ... | Juncellus, p. 310. |
| 6 | Bristles or scales beneath the ovary absent | ... | ... | ... | ... | ... | ... | 7 |
| | Bristles or scales beneath the ovary present | ... | ... | ... | ... | ... | ... | 8 |
| 7 | Base of style swollen, coming away from the nut before ripening | ... | ... | ... | ... | ... | ... | Fimbristylis, p. 310. |
| | Base of style tumour-like, remaining on the nut | ... | ... | ... | ... | ... | ... | Stenophyllus, p. 312. |
| 8 | Bristles present beneath the ovary | ... | ... | ... | ... | ... | ... | 9 |
| | Scales present beneath the ovary | ... | ... | ... | ... | ... | ... | Fuirena, p. 313. |
| 9 | Base of style swollen; leaves absent | ... | ... | ... | ... | ... | ... | Eleocharis, p. 313. |
| | Base of style not swollen; leaves usually present | ... | ... | ... | ... | ... | ... | Scirpus, p. 314. |

Cyperus, Linn.

Creeping underground stems often present. Leaves near the base of the stem, occasionally reduced to sheaths. Spikelets in globose or umbellate heads or spikes. Bracts 1 or more, leaf-like; bracteoles present. Rhachilla sometimes winged. Glumes arranged in 2 ranks, the 2 lowest empty, all nearly equal, the uppermost 1-3 sterile or empty. Stamens 1-3. Stigmas 2 or 3. Nut 3- or 2-sided.

1	Stems solitary	...	...	...	...	...	...	2
	Stems numerous, forming a tuft	...	...	...	...	...	...	9
2	Stems over 2 ft. in length	...	...	...	...	...	...	3
	Stems under 2 ft. in length	...	...	...	...	...	...	6
3	Horizontal underground stems present	...	...	...	...	...	...	4
	Horizontal underground stems absent	...	...	...	...	...	...	5
4	Stem very acutely 3-angled; leaves very long, often exceeding the stem in length; spikelets straw-coloured	...	...	...	...	...	...	procerus.
	Stem rounded below, obtusely 3-sided above; leaves almost absent or if present under 5 in. long; spikelets rusty brown...	...	...	...	...	...	...	corymbosus.
5	Spikelets 4-10 for each ray; nut tapering at the base	...	...	...	...	...	...	tegetum.
	Spikelets 20-40 for each ray; nut tapering at both ends	...	...	...	...	...	...	exaltatus.
6	Lower bract appearing as a continuation of the stem	...	...	...	...	...	...	arenarius.
	Bracts not appearing as continuations of the stem	...	...	...	...	...	...	7
7	Leaf-sheaths inflated; nut having stalk-like part at the base	...	...	...	...	...	...	Haspan.
	Leaf-sheaths not inflated; nut without a stalk-like part	...	...	...	...	...	...	8
8	Underground part of stem tuberous, fragrant, ovoid, black and tunicate	...	...	...	...	...	...	rotundus.
	Underground part of stem elongate, not fragrant, not tunicate.	...	...	...	...	...	...	stoloniferus.
9	Stamens 3	...	...	...	...	...	...	compressus.
	Stamens single	...	...	...	...	...	...	10
10	Whole plant yellowish; nut white when ripe	...	...	...	...	...	...	flavidus.
	Plant not yellowish	...	...	...	...	...	...	11
11	Stigmas 2; nut biconvex	...	...	...	...	...	...	pumilus.
	Stigmas 3; nut 3-angled	...	...	...	...	...	...	aristatus.

Cyperus procerus, Rottb.

Horizontal underground stems present. Stem actually 3-angled, about 3 ft. long. Leaves very long, often exceeding the stem in length, acuminate, $\frac{1}{4}$ - $\frac{1}{2}$ in. broad. Sheaths broad, thin. Umbels branched. Rays 3-7, stout, 1-4 in. long; secondary rays bearing loosely corymbose spikes of 5-10 spreading spikelets. Bracts 2-5, leaf-like, the longest up to 15 in. long. Spikelets linear-oblong, straw-coloured, 10-to 50-flowered, $2\frac{1}{2}$ -1 in. long

Rhachilla 4-sided. Glumes imbricate, boat-shaped, back 5-nerved. Stamens 3. Anthers yellow. Nut broadly obovoid, 3-sided, yellow, tapering towards the base. Stigmas 3. Flowers November to March.

Growing in pools near Guindy. On the banks of the Adyar near Saidapet. Red Hills, in marshy places.

Cyperus corymbosus, Rottb.

Stem solitary, somewhat rounded below and obscurely 3-sided above, 2-3 ft. long. Leaf almost absent or a short blade 5 in. long, having a long loose sheath below. Umbel compound. Rays 6-8, unequal, the longest up to 4 in. long; secondary rays terminated by corymbs of 4-8 spikelets. Bracts 3, rarely as long as the umbel. Bracteoles thin and narrow. Spikelets rusty-brown, $\frac{1}{4}$ -1 in. long. Glumes 3-nerved on the back. Stigmas thrice as long as the style. Nut 3-sided, tapering towards the base. Flowers in the rainy months.

In tanks. The stems are used in the manufacture of mats. This is a cottage industry in many villages in Chengleput District, particularly Athur.

Cyperus tegeum, Roxb.

Base of stem stout. Stem solitary, 3-angled, 2-4 ft. high. Leaves usually short, sometimes reaching 1 foot, having long sheaths. Bracts over 1 foot long. Umbels compound. Rays many, 1-5 in. long; secondary rays bearing corymbs each with 4-10 spikelets. Spikelets reddish-brown, 10 - to 30-flowered, $\frac{3}{8}$ - $\frac{3}{4}$ in. long. Glumes 3- to 5-nerved on the back. Stigmas longer than the style. Rhachilla winged. Nut yellowish-brown, 3-angled, tapering to the base. Flowers in November and December.

In wet places.

Cyperus exaltatus, Retz

A large herb. Horizontal underground stems absent. Stems obtusely 3-sided, 3-6 ft. high. Leaves few, longer or shorter than the stem, linear, finely acuminate, $\frac{1}{4}$ - $\frac{3}{8}$ in. broad. Umbels branched. Rays 5-10, spreading, up to 6 in. long, bearing spikes $\frac{3}{4}$ -2 in. long and of 20-40 rather distant short spikelets. Spikelets chestnut-brown, much compressed 8- to 10-flowered. Rhachilla narrowly winged. Glumes mucronate, closely imbricate, back obscurely 3-nerved. Stamens 3. Anthers yellow. Nut ellipsoid, tapering to both ends, 3-sided, brownish or yellow. Stigmas 3, rather shorter than the style. Flowers November to February.

In wet places near Guindy. Red Hills, in watery situations.

Cyperus arenarius, Retz

Creeping underground stems present. Stem solitary, 4-12 in. long. Leaves longer or shorter than the stem, rigid and tough, almost nerveless. Spikelets crowded together into a head $\frac{1}{2}$ -1 $\frac{1}{2}$ in. in diameter on the summit of the stem, straw-coloured

or brown, 8- to 16-flowered, up to $\frac{1}{2}$ in. long. Bracts 2-3, leaf-like, rigid, the lowest the longest, appearing as a continuation of the stem, 2-4 in. long. Stamens 3. Stigmas 3, much longer than the style. Nut black, obovoid, rounded at the apex, 3-angled. Flowers October to January.

In sandy places near the sea.

Cyperus Haspan, Linn.

Creeping underground stems present. Stem solitary, 4-24 in. long. Leaves shorter than the stem; sheaths inflated. Umbels simple or compound. Rays 4-12, up to 3 in. long; secondary rays with 3-8 spikelets. Spikelets 10- to 40-flowered. Bracts 2 or 3, shorter than the rays. Stamens 2 or 3. Stigmas 3, thin as hair. Nut globosely obovoid, 3-sided, carried on a short stalk-like structure. Flowers November to January.

In rice fields.

Cyperus rotundus, Linn.

கோரைக்கிழங்கு Pl. XXXVIII, C.

Tuberous part of underground stem black, slightly fragrant, $\frac{1}{3}$ in. or more in diameter. Stems solitary, 3-angled at the top, varying in length, up to 1 foot high. Leaves of varying lengths, finely acuminate. Umbels simple or compound. Rays 2-8, bearing short spikes of 3-10 spikelets. Bracts 3, variable in length, sometimes reaching 6 in. in length. Spikelets 10- to 50-flowered, compressed. Rhachilla winged. Stamens 3. Nut greyish-black. Flowers in November and December.

Common in moist places.

Cyperus stoloniferus, Retz

Creeping underground stems present. Stems solitary, 4-8 in. long. Leaves longer or shorter than the stem. Umbels with few rays up to 1 in. long; or often spikelets united into a head. Bracts 3, of varying lengths. Spikelets closely packed, 8- to 20-flowered, $\frac{1}{3}$ in. long. Rhachilla of spikelets winged. Stigmas 3, long. Nut obovoid, unequally 3-sided. Flowers December to February.

Ennur, on newly formed sand banks.

Cyperus compressus, Linn.

Stems tufted, 3-sided, 4-16 in. long. Leaves shorter or longer than the stem, 1-nerved. Umbels simple, often reduced to a head. Rays 3-6, up to 3 in. long, bearing 4-8 terminal spikelets. Bracts 3-5, finely acuminate, up to $4\frac{1}{2}$ in. long. Spikelets much compressed, yellow when ripe, 20- to 40-flowered, $\frac{1}{2}$ -1 in. long. Glumes closely imbricate, with a sharp point at apex. Stamens 3. Stigmas 3, as long as style. Nut black, 3-sided. Flowers October to January.

In wet places.

Cyperus flavidus, Retz

Stems tufted, obtusely 3-sided, 6-8 in. high. Leaves shorter or longer than the stem. Umbels compound. Rays many, 1-2 in. long; the secondary ones $\frac{1}{2}$ -1 in. long, bearing heads of spikelets which are yellow when mature. Bracts 2-3, the longest reaching 6 in. in length. Glumes obscurely 3-nerved. Stamens single. Nut globosely obovoid, with a stalk-like portion at the base, white. Flowers in January and February.

On borders of ponds and in rice fields.

Cyperus pumilus, Linn.

Stems tufted, 1-12 in. long. Leaves shorter or longer than the stems, 1-nerved. Heads of spikelets up to $\frac{1}{2}$ in. in diameter, sometimes umbellate. Bracts 3 or 4, up to $4\frac{1}{2}$ in. long. Spikelets much compressed, 20- to 50-flowered, up to $\frac{3}{8}$ in. long. Glumes bifid at the tip. Stamens single. Stigmas 2, nearly as long as style. Nut brown, biconvex, with a point at apex. Flowers during the rains.

In wet places.

Cyperus aristatus, Rottb.

Stems tufted, 3-angled, 3-6 in. high. Leaves shorter than the stems, 1-nerved, flaccid. Umbels with 2-5 rays or often crowded into a head of numerous spikelets. Bracts 2-5, the longest reaching 3 in. in length. Spikelets 6- to 20-flowered, brownish. Stamens single. Stigmas 3, hair-like, almost as long as the style. Nut narrowly obovoid, rounded, 3-angled, with a short point at apex, tapering to the base. Flowers after the rains.

In sandy places.

Mariscus, Vahl

Leaves and bracts grass-like. The lowest two glumes empty, the others nut-bearing. Other characters same as *Cyperus*.

Inflorescence contracted into dense heads *dregeanus*.

Inflorescence consisting of 5-10 spikes arranged as in an

umbel *cyperinus*.

Mariscus dregeanus, Kunth

Stems numerous, tufted, glabrous, 3-cornered at top, 4-12 in. long. Sheaths often as long as stems, dilated, reddish. Heads ovoid, $\frac{1}{3}$ in. in diameter. Bracts 3-5, leaf-like, up to 6 in. long. Spikelets numerous. Fruit-bearing glumes 14- to 19-nerved. Stamens 2. Styles 2- or 3-branched. Flowers in August and September.

Borders of ponds and tanks.

Mariscus cyperinus, Vahl

Stems glabrous, 6-10 in. high. Leaves as long as the stems or longer. Bracts 5-7, leaf-like, 4-8 in. long. Spikes 5-10, dense, cylindrical, $\frac{2}{3}$ in. long. Spikelets 2-flowered. Flowers in November and December.

In moist places at Ennur.

Kyllinga, Rottb.

Herbs with perennial underground stems. Stem 3-sided, leafy below only, having 1-3 head-like spikes at the extremity. Spikelets minute, 1- or 2-flowered, densely packed in short globose spikes. Glumes 4 for each spikelet, the lower two much smaller and empty. Stamens 1-3. Stigmas 2, linear.

Underground part of stem creeping, elongate; nut-bearing
 ing glume winged on the upper part monocephala.
 Underground part of stem very short; nut-bearing glume
 not winged triceps.

Kyllinga monocephala, Rottb.

Stems erect, usually single, 3-12 in. high. Leaves shorter than the stem, linear, acute, having a strong midrib. Spikes usually single, $\frac{1}{4}$ in. in diameter. Bracts underneath spikes 3 or 4, very similar to the leaves, very long and narrow. Spikelets 1-flowered. Flowers during the rainy season.

Very common in waste places.

Kyllinga triceps, Rottb.

Stems tufted, 2-9 in. long. Leaves linear, acute, shorter than the stem. Spikes ovoid-oblong, 3 together, the middle one the largest, $\frac{1}{4}$ in. in diameter. Bracts beneath the head 3 or 4, leaf-like, up to 3 in. long. Stamens 2. Flowers October to January.

On waste ground.

Pycreus, Beauv.

Characters of *Cyperus* but nut compressed sideways and style dividing into 2 branches.

Stem under 4 in. high nitens.
 Stem 1-2 ft. high cappillaris.

Pycreus nitens, Nees

Stems forming a tuft. Leaves often as long as stem, weak. Spikes under 1 in. long. Spikelets up to 40 in each spike. Glumes boat-shaped, 3- to 5-nerved. Stamens single. Flowers December to February.

Common at Adyar.

Pycreus cappillaris, Nees

Stems tufted, 1-2 ft. high. Leaves weak, 4-12 in. long. Spikes numerous, clustered into an umbel-like head, less than 1 in. long. Spikelets up to 50 in each spike, many-flowered. Stamens 2. Flowers in September and October.

In moist places in the city. Red Hills, near the tank.

Fimbristylis polythricioides, Vahl

Root-fibres slender. Stems slender, glabrous, 3-sided, having fine longitudinal lines, 2-10 in. long. Leaves more than half the length of the stems, slender, wiry, having fine longitudinal lines. Spikelets standing singly at the ends of stems, oblong-ellipsoid, many-flowered. Glumes almost white or pale straw-coloured. Stamens 1-3. Nut biconvex, yellow, dotted with white spots. Flowers October to February.

In moist places in the city. Ennur.

Fimbristylis argenticola, Vahl

A densely tufted whitish-looking annual. Root-fibres very slender. Stems 3-angled, very slender, having very fine longitudinal lines. Leaves shorter and more slender than the stems. Spikelets 3-20, forming a globose head at the ends of stems, cylindrical, many-flowered. Bracts 3-4, much longer than the head, up to 3 in. long. Glumes ovate, obtuse, obscurely 3-nerved on the back. Stamens single. Nut biconvex, roundish-obovoid, with acute margins, straw-coloured. Stigmas 2, shorter than the style. Flowers after the rains.

Common in the city and suburbs.

Fimbristylis ferruginea, Vahl

Root-fibres stoutish. Stems somewhat 3-sided, 1-2½ ft. long. Leaves absent or if present very short in proportion to the length of stems. Sheaths minutely and softly hairy. Spikelets not numerous, pale reddish-brown, ellipsoid, about ¾ in. long. Glumes broadly ovate, with a sharp point at apex, not ribbed. Stamens 2 or 3. Nut with a stalk-like base, pale straw-coloured, not ribbed. Flowers December to March.

In pools in the city. Near Red Hills Tank.

Fimbristylis spathacea, Roth

Root-fibres some stout and some slender. Stems densely leafy below, obtusely 3-angled, with fine longitudinal lines, ½-1½ ft. long. Leaves densely crowded, spreading, much shorter than the stem, rigid, tough, margins rough. Umbels branched in the local form. Bracts short, rigid, with broad dilated bases. Spikelets ovoid, pale brown, about ½ in. long. Glumes broadly ovate, transparent but for a reddish-brown band at the back, obscurely 3- to 5-nerved. Stamens 2. Nut rounded at the apex, tapering at base, at first yellow, afterwards black. Flowers in November and December.

In wet places near Adyar.

Fimbristylis dichotoma, Vahl

Stems short, slender, with fine longitudinal lines, 2-10 in. long. Leaves very narrow, tapering to a fine point, shorter than the stems. Umbels loosely branched. Rays up

to 1 in. long. Bracts slender. Spikelets ellipsoid. Glumes reddish-brown, ovate, 1- to 3-nerved on the back, with an abrupt point at apex. Stamens 1-3. Stigmas recurved. Nut biconvex, ribbed, pale straw-coloured or almost white. Flowers October to January. Common in the city.

Fimbristylis diphylla, Vahl

Root-fibres stoutish. Stems smooth, with fine longitudinal lines, angled, 6-24 in. long. Leaves shorter than the stem, rather rigid, with fine longitudinal lines above, 2-nerved beneath. Umbels not branched in the local form. Rays few, very unequal, up to 2 in. long. Bracts slender. Spikelets ovoid, acute, about $\frac{1}{4}$ in. long. Glumes green, 3-nerved, with chestnut-brown sides. Stamens 1-3. Nut many-ribbed, with a short stalk-like base, pale straw-coloured or nearly white. Flowers after the rains.

Near pools in the city.

Fimbristylis miliacea, Vahl

Stem obtusely angled below, 3-sided above, 6-24 in. long. Leaves shorter than the stem, tapering to a firm point at apex. Umbels branched. Rays unequal, slender. Spikelets subglobose, brown, obtuse. Glumes ovate, obtuse, obscurely nerved. Stamens 1-3. Nut obovoid, obtusely 3-angled, yellow, with fine lines. Style as long as the nut. Stigmas 3, as long as the style. Flowers in October.

In moist places in the city. Adyar.

Fimbristylis monostachya, Hassk.

Stems very slender, 6-12 in. long. Leaves crowded on the swollen base of the stem, about half as long as the stem. Spikelets standing singly on the stem, shiny, pale straw-coloured, $1\frac{1}{5}$ - $1\frac{1}{2}$ in. long. Glumes more or less 2-ranked. Anthers 3, yellow. Stigmas 3, shorter than the style. Nut acutely 3-angled, with a stalk-like base, covered with tubercles, straw-coloured. Flowers after the rains.

In moist places near the city.

Fimbristylis tristachya, Thw.

Stem 1-2 $\frac{1}{2}$ ft. long. Leaves rigid, up to $\frac{1}{3}$ the length of stem. Spikelets 2-5, large for the species, twisted, compressed, pale straw-coloured on the sides, 1 in. long. Stamens 3. Stigmas 3. Nut large, obovoid, brownish-black, covered with tubercles. Flowers September to March.

Guindy Park.

Stenophyllus, Rafin. (*Bulbostylis*, Kunth)

Stems slender, leafy at the base only. Leaves very narrow, slender. Spikelets small, crowded in heads at the ends of stems. Glumes few, 1 or 2 of the lowest and often the uppermost one empty. Stamens 1-3. Styles 3-branched. Fruit 3-sided, crowned by the persistent base of style.

Stenophyllus barbata, Rottb.

Stems tufted, slender, glabrous, 3-12 in. high. Leaves thread-like, about half as long as the stem. Leaf-sheaths thin, with bearded mouths. Heads $\frac{1}{4}$ - $\frac{1}{2}$ in. in diameter. Spikelets reddish-brown. Glumes boat-shaped. Stamens single. Nut obovoid, with prominent angles, straw-coloured. Flowers August to December.

Common in the city and suburbs.

Fuirena, Rottb.

Leafy herbs. Leaves linear-lanceolate. Leaf-sheaths entire. Spikelets many-flowered, in dense clusters. Glumes with a stout 3-nerved keel. Nut enclosed by 3 scales. Stamens 2 or 3. Style slender, 3-branched, finally falling away. Fruit 3-cornered, furnished with a beak above.

Scales enclosing the nut having stalks glomerata.

Scales enclosing the nut not having stalks umbellata.

Fuirena glomerata, Lamk.

Stems slender, erect, leafy, 4-12 in. long. Leaves linear-lanceolate, acuminate, 3- to 5-nerved, hairy, 2-5 in. long. Bracts absent. Spikelets clustered. The lowest glumes empty. Scales covering the nut 3-nerved and 3-toothed at apex. Flowers in the rainy months.

Common in rice fields.

Fuirena umbellata, Rottb.

Stems with creeping underground parts, ribbed with nodes throughout their length, 1-4 ft. long. Leaves linear-lanceolate, 3- to 5-nerved, 6-10 in. long, up to $\frac{2}{3}$ in. broad. Leaf-sheaths with a small brown tip at the top. Spikelets crowded into dark brown clusters $\frac{1}{2}$ -1 in. in diameter. Bracts beneath the clusters short. Glumes strongly 3-nerved. Scales covering the nut 3-nerved. Stamens 3. Fruit triangular in cross-section, with a long beak. Flowers in the rainy months.

In wet places.

Eleocharis, R.Br.

Stems tufted, erect, glabrous, embraced by thin sheaths. Leaves absent. Inflorescence a single ovoid or cylindrical many-flowered spikelet. The lowest and the top-most glumes empty. Bristles present beneath the ovary. Stamens usually 3. Style with a swollen base. Style 2- or 3-branched. Fruit crowned by the persistent and swollen base of style.

Eleocharis capitata, R.Br.

Stems forming dense tufts, numerous, slender, triangular in cross-section, 2-10 in. long. Sheaths short. Spikelets globose-ovoid, rounded at the apex, $1/10$ - $1/8$ in. in diameter. Bristles beneath the ovary 7 or fewer, rough. Styles 2-branched. Fruit obovoid, brown, smooth, crowned by the broad base of style. Flowers in October and November.

Red Hills, in pools near the tank.

Scirpus, Linn.

Stems forming tufts, leafy at the base only. Spikelets many-flowered. The lowest and a few of the uppermost glumes empty. Stamens 1-3. Ovary obovoid. Style slender, the base not swollen, 2- or 3-branched.

- 1 A large or medium-sized herb; stems 1 foot or more in length 2
 A small herb less than 6 in. high squarrosus.
- 2 Flowers appearing nearer to the base than the top of the stem; the latter rather stout, circular in cross-section, spongy inside articulatus.
 Flowers appearing nearer to the top than the base of stem; the latter slender, obtusely triangular in cross-section supinus.

Scirpus squarrosus, Linn.

Leaves much shorter than the stem, slender, acuminate, erect. Spikelets 2-4 in a cluster, globose-oblong, many-flowered, up to $1/4$ in. long. Bracts 1-3, leaf-like, slender, acuminate, up to 1 in. long. Extremities of glumes spreading and recurved. Stamens 1 or 2. Style very short. Stigmas 3, minute. Flowers in February and March. Common.

Scirpus articulatus, Linn.

Pl. XXXVIII, D.

Stems forming dense tufts, cylindrical, spongy and transversely divided within (the divisions visible from outside), as thick as the little finger or less, 1-3 ft. long. Leaves absent; the sheaths at the base of stems with an acute tip, sometimes up to 1 in. long. Spikelets ovoid-oblong, acute, arranged in spreading clusters on the sides of stems. Stamens 3. Branches of style as long as the style. Nut obovoid, having transverse wavy lines. Flowers December to February.

In wet places.

Scirpus supinus, Linn.

Stems slender, 6-12 in. high. Leaves absent; leaf-sheaths not produced. Spikelets coming off 2-6 in. below the top of the stems, 3-8 in a cluster, up to $\frac{1}{4}$ in. long. Style and branches of style very short. Flowers in February and March.

Adyar. Vandalur.

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GLOSSARY.

A

- ACHENE, a small, dry, hard, 1-celled, 1-seeded fruit that does not break open, in Compositae with adnate calyx.
- ACUMEN, a tapering point.
- ACUMINATE, tapering to a long point.
- ACUTE, ending with a sharp point.
- ADVENTITIOUS, of roots, not arising from the base of the stem but from other parts, usually nodes.
- AERIAL-ROOTS, those originating and functioning above the surface of the ground.
- ALTERNATE, of leaves, placed on opposite sides and at different levels on the stem.
- ALTERNATING, standing between, as stamens between petals instead of before them.
- ANNUAL, completing its cycle of growth within one year.
- ANNULAR, ring-shaped.
- ANTHER, the pollen-bearing part of a stamen.
- APEX, tip.
- APPENDAGE, a part added to another ; process.
- ASCENDING, of stems, oblique at first and then becoming erect.
- ATTENUATE, narrowed.
- AWN, a bristle-like appendage.
- AXIL, the upper angle formed by a leaf with the stem.
- AXILLARY, situated in an axil.
- AXIS, a main stem round which organs develop.

B

- BEARDED, having tufts of hairs.
- BERRY, a pulpy fruit without a stony part inside.
- BIFID, more or less cleft into two parts.
- BISEXUAL OR 2-SEXUAL, having both stamens and pistil.
- BLADE, the expanded part of a leaf not including the stalk.
- BLOOM, thin, white, waxy film on leaves or other organs.
- BRACT, a modified leaf below a flower or an inflorescence.
- BRACTEOLE, a modified leaf below the individual flowers of an inflorescence.
- BULB, an underground leaf-bud in which usually some of the leaves have become fleshy.
- BULBIL, leaf-buds which drop and develop into new plants.
- BUTTRESS, large outgrowths of lower parts of the trunk for giving support.

C

CALYX, the outermost, usually green, envelope of a flower.

CALYX-TUBE, the part of a calyx formed by the uniting of the sepals.

CAPSULE, a dry fruit having two or more cells and which breaks open when mature.

CARPEL, a simple pistil or element of a compound pistil corresponding in its origin to a single leaf.

CELL, the cavity of an ovary, fruit or anther.

CLADODE, a branch assuming the function and often the form of a leaf.

CLAW, the narrowed base of a petal.

CLEFT, partly divided.

CLIMBER, a plant that climbs by other means than twining.

COMA, a tuft of long hairs at the end of some seeds.

COMPOUND, of a leaf, divided into separate leaflets; of an inflorescence, branched.

CONNECTIVE, the part which joins the two cells of an anther.

CONTORTED, of petals or sepals in bud, one rolled or twisted up in another.

CORDATE, heart-shaped.

COROLLA, the inner part of the perianth usually consisting of coloured leaf-like parts.

CORONA, outgrowths on the corolla between the latter and the stamens.

CORYMB, a flat or convex-topped indeterminate flower-cluster in which stalked flowers are disposed along an axis.

CREEPING, running on the ground and rooting at the nodes.

CRENATE, cut into rounded teeth.

CRISPATE, of the surface of a leaf or petal, crumpled or puckered.

CYLINDRICAL, long and having a circular cross-section.

CYME, a flower-cluster in which the older flowers are higher up the axis than the younger ones.

D

DECIDUOUS, of trees or shrubs, shedding the leaves annually at a certain season; of petals and stipules, falling off before drying.

DECURRENT, of blades of leaves, prolonged beyond their insertion and appearing to continue along the stem.

DEFINITE, of a constant number.

DEFLEXED, turned abruptly downwards.

DELTOID, shaped like an equilateral triangle.

DICHOTOMOUS, dividing into two at each point of separation, usually in a regular manner.

DISK, a development of the receptacle of a flower at or around the base of the pistil.

DIVIDED, of leaves, cut into segments.

DRUPE, a pulpy fruit with a hard or stony part inside enclosing the seed.

DRY, not juicy or fleshy.

E

- ELLIPSOID, a solid with elliptical longitudinal section.
ELLIPTICAL, regularly oval.
EMARGINATE, having a notch at the end.
ENTIRE, not toothed or divided.
EPIPHYTIC, growing on other plants but without depending on them for food.
EVERGREEN, bearing foliage all through the year.

F

- FEMALE, of flowers, having no stamens.
FIBROUS, of roots, consisting of threads.
FILAMENT, the stalk-like part of a stamen which supports the anther.
FLESHY, succulent or juicy ; having soft parts.
FLORAL-LEAF, bract.
FLORET, one of the numerous small flowers that together form a head in the Compositae.
FOLLICLE, a fruit opening along one edge and having the seeds attached to that edge.
FREE, not adhering.

G

- GALL-FLOWERS, aborted female flowers of the genus *Ficus*.
GERMINATE, of seeds, starting to grow.
GLABROUS, completely without hairs.
GLAND, a secreting structure.
GLANDULAR, having glands.
GLUME, one of the chaff-like bracts of the inflorescence of grasses and sedges.

H

- HASTATE, of leaves, with a pair of lobes at the base which stand out nearly at right angles.
HEAD, a dense cluster of sessile flowers on a receptacle or a very short axis.
HEARTWOOD, the innermost and oldest wood next to the pith.
HELIX, coiled like a snail-shell.
HERB, a small plant not becoming woody.

I

- IMBRICATE, of a calyx or corolla in bud, having one part wholly overlapped and another wholly external.
IMPARIPINNATE, pinnately compound with an odd leaflet at the end.
IMPERFECT, not developed.
INDEHISCENT, not opening.
INDUPLICATE, "with the margins bent inwards, and the external face of these edges applied to each other, without twisting." Asa Gray.

INFERIOR, of the calyx, below the ovary; of the ovary, appearing to grow below the calyx to which it is adherent.

INFLEXED, curved inwards.

INFLORESCENCE, the flowering part of a plant; the disposition of the flowers on the axis.

INTERNODE, the part of the stem between two nodes.

INTRODUCED, not indigenous to the region.

INVOLUCRE, a collection of bracts surrounding a head or flower-cluster.

IRREGULAR, of flowers, showing inequality in size of similar parts.

K

KEEL, the two innermost united petals of a papilionaceous corolla.

L

LANCEOLATE, shaped like a lance-head.

LEAFLET, each piece into which a compound leaf is divided.

LIMB, the expanded portion of an organ.

LINEAR, very long and narrow.

LIP, the upper or lower half of an irregular calyx or corolla.

M

MALE, of a flower, developing stamens but not pistil.

MANGROVE, trees or shrubs characteristic of saline swamps.

MIDRIB, the main rib of a leaf.

N

NERVE, a vein.

NETTED, of veins, branching irregularly and forming a net-work.

NEUTER, of a flower, having neither stamens nor pistil.

NODE, a joint on a leaf-bearing stem or the leaf-bearing region of a stem.

NUT, a hard, 1-celled, 1-seeded fruit that does not break open.

O

OBCONIC, conical but attached at the apex.

OBLANCEOLATE, inverted lanceolate.

OBLIQUE, slanting; having unequal sides.

OBLONG, much longer than broad with nearly parallel sides.

OBOVATE, inverted ovate.

OBOVOID, a solid body having an obovate longitudinal section.

OBTUSE, rounded at the end.

OPPOSITE, of leaves, two standing on either side of the same node; of flower parts, one standing in front of another as seen from the centre.

ORBICULAR, circular in outline.

OVARY, the part of the pistil which contains the ovules.

OVATE, having an outline like that of an egg with the broader end downwards.

OVOID, a solid having an egg-shaped longitudinal section.

OVULE, the young seed in the ovary before it completes its development.

P

PALMATE, lobed or divided so that the segments radiate as the fingers of the hand.

PANICLE, a loose flower-cluster; a branched raceme or corymb.

PAPPUS, tufts of hairs attached to the top of the ovary and representing the calyx in Compositae.

PARASITIC, growing on other plants and depending on them for nourishment.

PARIPINNATE, pinnate, with an equal number of leaflets, that is, without a terminal leaflet.

PEDICEL, the stalk of each individual flower in an inflorescence.

PEDUNCLE, a main flower-stalk supporting a cluster of flowers or a solitary flower.

PELTATE, of leaves, attached to the stalk by the lower surface instead of at a point on the margin.

PERENNIAL, living for several years.

PERFECT, of a flower, having both stamens and pistil; of stamens, having fertile anthers.

PERIANTH, the leaf-like, protective part of a flower enclosing the reproductive organs.

PERSISTENT, not falling off.

PETAL, a division of the corolla.

PETIOLE, the stalk of a leaf.

PINNA, one of the branches of the main axis in a twice- or thrice-compound leaf.

PINNATE, feather-like.

PISTIL, the seed-bearing part of the flower usually consisting of ovary, stigma and style.

PLACENTA, the part in the ovary to which the ovules are attached.

POD, any 1-celled, dry fruit that breaks open.

POLLEN, the fertilising, dust-like powder contained in the anther.

PORE, any small aperture, as in anthers for the escape of pollen.

POSTERIOR, situated close to the axis.

PRICKLE, thorny or sharp outgrowths from the bark.

PROCUMBENT, spreading on the ground without rooting at the nodes.

PROSTRATE, lying still closer to the ground.

R

RACEME, an inflorescence of stalked flowers on an elongated axis, the youngest flowers being at the upper end.

RACHIS, the axis of an inflorescence or a compound leaf.

RAY, the marginal florets in the Compositae as differentiated from the disk-florets; one of the radiating branches of an umbel.

RECEPTACLE, the part of the axis in a flower which supports the calyx, corolla, stamens and pistil.

RHACHILLA, a secondary axis in the inflorescence of sedges and grasses.

RHIZOME, a prostrate, underground stem of root-like appearance the apex of which sends up leaves or shoots.

RIB, a strong vein.

ROSETTE, a circular cluster of leaves or other organs.

RUDIMENTARY, imperfectly developed.

S

SAGITATE, prolonged downwards into two straight lobes.

SALVER-SHAPED, having a slender tube which abruptly expands into a disc.

SAPWOOD, the new wood in a Dicotyledonous plant.

SCALE, a very thin, dry structure which is not green.

SCAPE, a leafless peduncle arising from the ground.

SCORPIOID, of the axis of an inflorescence, coiled like the tail of a scorpion.

SENSITIVE, responsive to touch.

SEPAL, a segment of a calyx.

SERRATE, with sharp teeth pointing forwards.

SESSILE, not stalked.

SHEATH, the tubular part at the base of a leaf or a stipule surrounding the stem.

SHRUB, a woody plant not as large as a tree, usually not over 8 ft. high.

SIMPLE, of leaves, in one piece, not compound; of flowers, single, not composite.

SPADIX, a spike with a more or less stout and fleshy axis.

SPATHE, a large bract enclosing a spadix.

SPATULA-SHAPED, oblong with a narrowed base.

SPICATE, spike-like.

SPIKE, an inflorescence in which sessile flowers are arranged on an elongated axis.

SPIKELET, a secondary spike; a cluster of one or more flowers in sedges or grasses subtended by a common pair of glumes.

SPINES, a hard, sharp-pointed structure formed as a result of the transformation of a branch, stipule or some other organ.

SPUR, a slender, usually hollow, prolongation of a calyx or corolla.

STAMEN, the organ in the flower that bears the pollen.

STAMINODE, a sterile stamen.

STANDARD, the enlarged upper petal of a papilionaceous corolla.

STERILE, barren, as a stamen with an undeveloped anther or a pistil with undeveloped ovules.

STIGMA, the top part or surface of a pistil or style which receives the pollen.

STILT-ROOTS, the prop-like roots that support the trunk of plants such as Pandanus.

STIPEL, an appendage of a leaflet at its place of insertion.

STIPULE, an appendage of a leaf at its place of insertion.

STYLE, the elongated portion of the pistil between the ovary and stigma.

SUCCULENT, thick and juicy.

SUPERIOR, of the ovary ; not adherent to the calyx, of the calyx, adherent to the ovary.

T

TAP-ROOT, the primary root.

TENDRIL, slender, usually coiling, organs by the help of which a plant climbs.

THROAT, the orifice between the tube and the limb of a corolla.

TRAILING, lying flat on the ground but not rooting.

TRICHOTOMOUS, branching into three divisions.

TRUNCATE, ending abruptly as though cut off.

TUBE, the united portion of a corolla or calyx.

TUBER, a thick and short underground stem beset with buds or "eyes."

TUBERCLE, warty protuberance.

TWINER, plants which climb by winding their stems round a support.

TWISTED, of petal or corolla-lobe, rolled up in one another.

U

UMBEL, an inflorescence in which the stalks of each flower of a cluster arises from the same point.

UNISEXUAL OR I-SEXUAL, of one sex ; either with stamens only or with pistils only.

V

VALVATE, of calyx or corolla in bud, meeting by the edges without overlapping.

VALVE, one of the pieces into which a capsule splits.

VEIN, slender, thread-like ramifications in a leaf or any flat organ.

W

WHORL, an arrangement of leaves or other organs in a circle round an axis.

WING, one of the two lateral petals of a papilionaceous corolla ; any thin expansion bordering or surrounding an organ.

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బిళ్లగన్నేరు	171	ముచుకుందము	59	వేపచెట్టు	63
బీర	129	ముత్తవపులగము	33	శంఖపుష్పి (దంతెన)	90
బుడమకాయ	180	మునగ	73	శిరివేరు	135
బుడ్డకాకర	70	ములుగోరంట	220	శీతాఫలము	21
బుడ్డబుడమ	204	ముల్లంగి	26	శ్రీగంధపుచెట్టు	256
బూడిదగుమ్మడి	129	ముప్పిచెట్టు	181	సన్నపప్పుకూర	33
బూరుగు	47	మూకత్రికాయ	194	సపోటా	163
బెండచెట్టు	44	మెంతులు	94	సాంబ్రాణిచెట్టు	205
బొంతజెముడు	135	మొగిలి	297	సాగ	287
బొక్కనచెట్టు	227	మోదుగ	86	సార	72
బొడ్డి	192	రణజేరి	232	నీతమ్మసోగునూలు	191
బొడ్డికూర	33	గాచడిశిరిక	265	నీమచింత	110
బొప్పాయిచెట్టు	126	రామఫలము	21	నీమతంగేడు	103
బోడతరము	158	రావిచెట్టు	273	నీమలవినె	102
బ్రహ్మదండి	25	రుద్రజడ	234	నీమకల	101
బ్రహ్మమేడి	273	రెడ్డివారి నానుబాబు	260	నుగంధిపాల	277
భద్రాక్ష	237	రెడ్డివారి నానుబాబు	261	చిన్నది	203
మంగ	146	రెప్పాల	173	సూర్యకాంతి	30
మంహాకబ్రహ్మ	140	రేగు	66	సూర్యకాంత	159
మందార	96	రేల	101	సెనగ	94
మగబీర	235	లింగనొండ	130	సార	128
మదనఘంట	138	చంకాయచెట్టు	203	సోమింట	90
మద్ది	140	వరిగెడ్డ	123	స్వర్ణగన్నేరు	212
మనోరంజితము	28				

PLATE I.

- A. *Anona squamosa.*
- B. *Polyalthia longifolia.*
- C. *Tinospora cordifolia.*
- D. *Portulaca oleracea.*

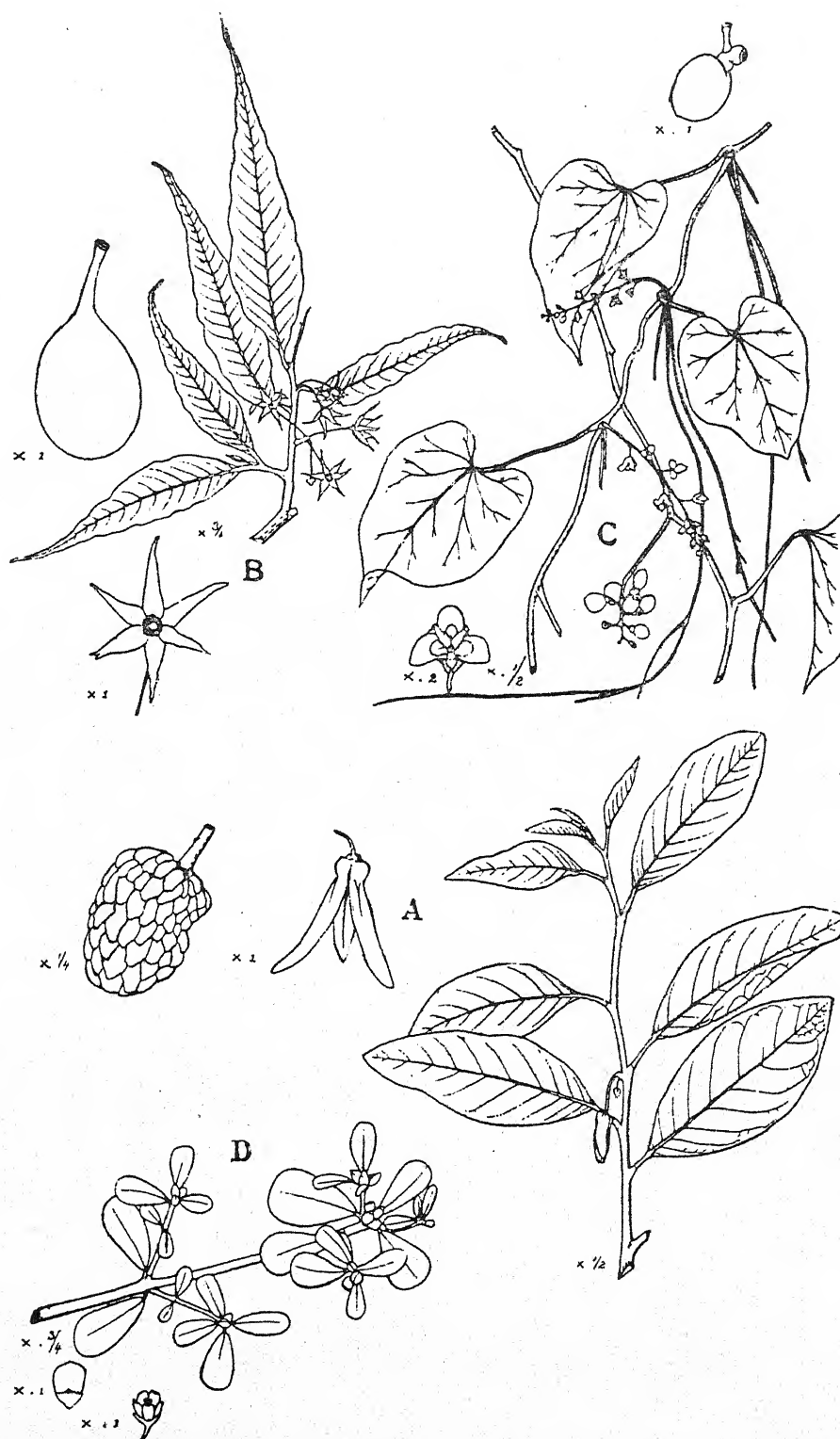




PLATE II.

- A. *Nymphaea pubescens.*
- B. *Argemone mexicana.*
- C. *Brassica juncea.*
- D. *Cleome viscosa.*
- E. *Capparis zeylanica.*

PLATE III.

- A. *Ionidium suffruticosum.*
- B. *Polygala chinensis.*
- C. *Polycarpaea corymbosa.*
- D. *Bergia capensis.*
- E. *Calophyllum inophyllum.*

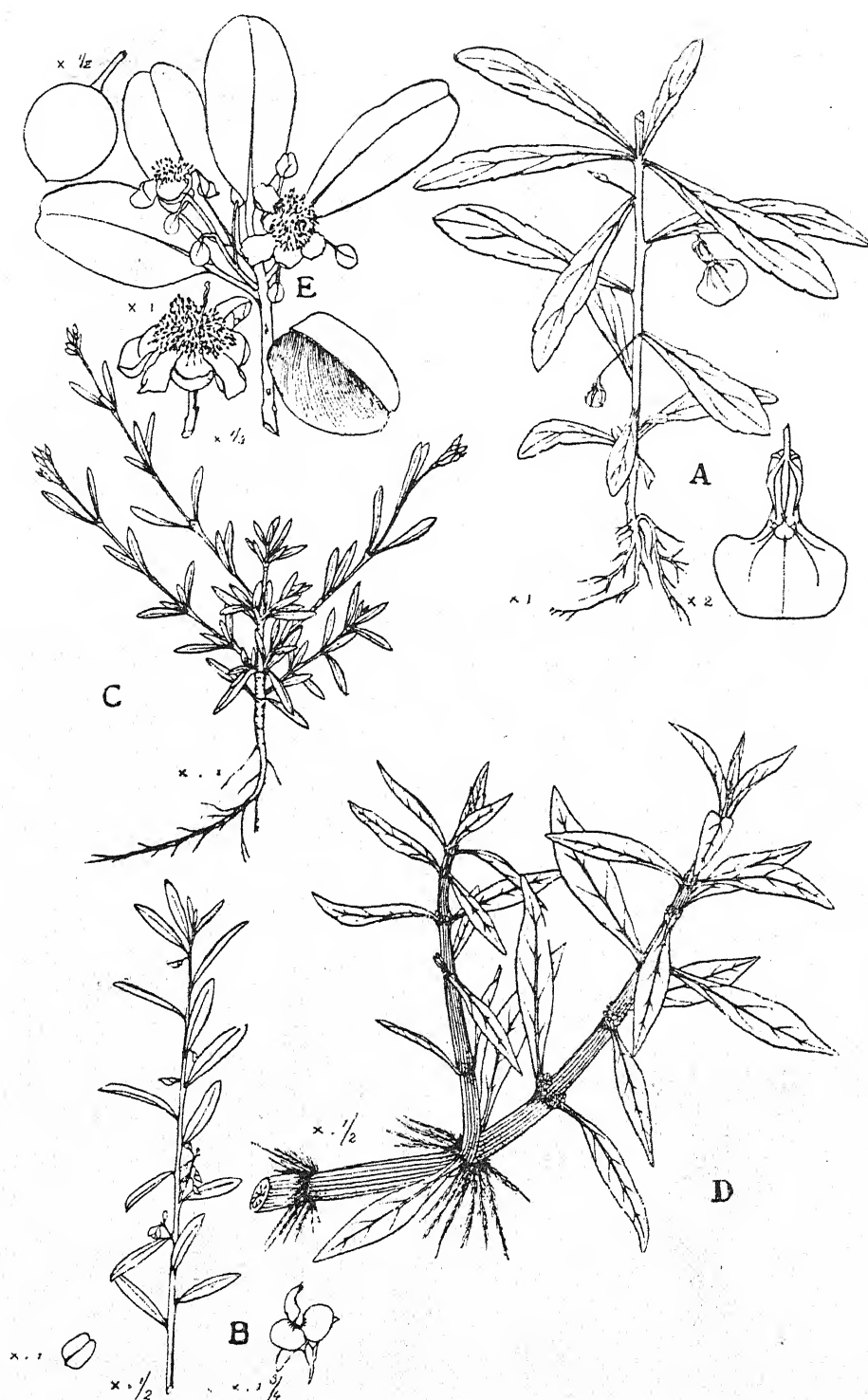




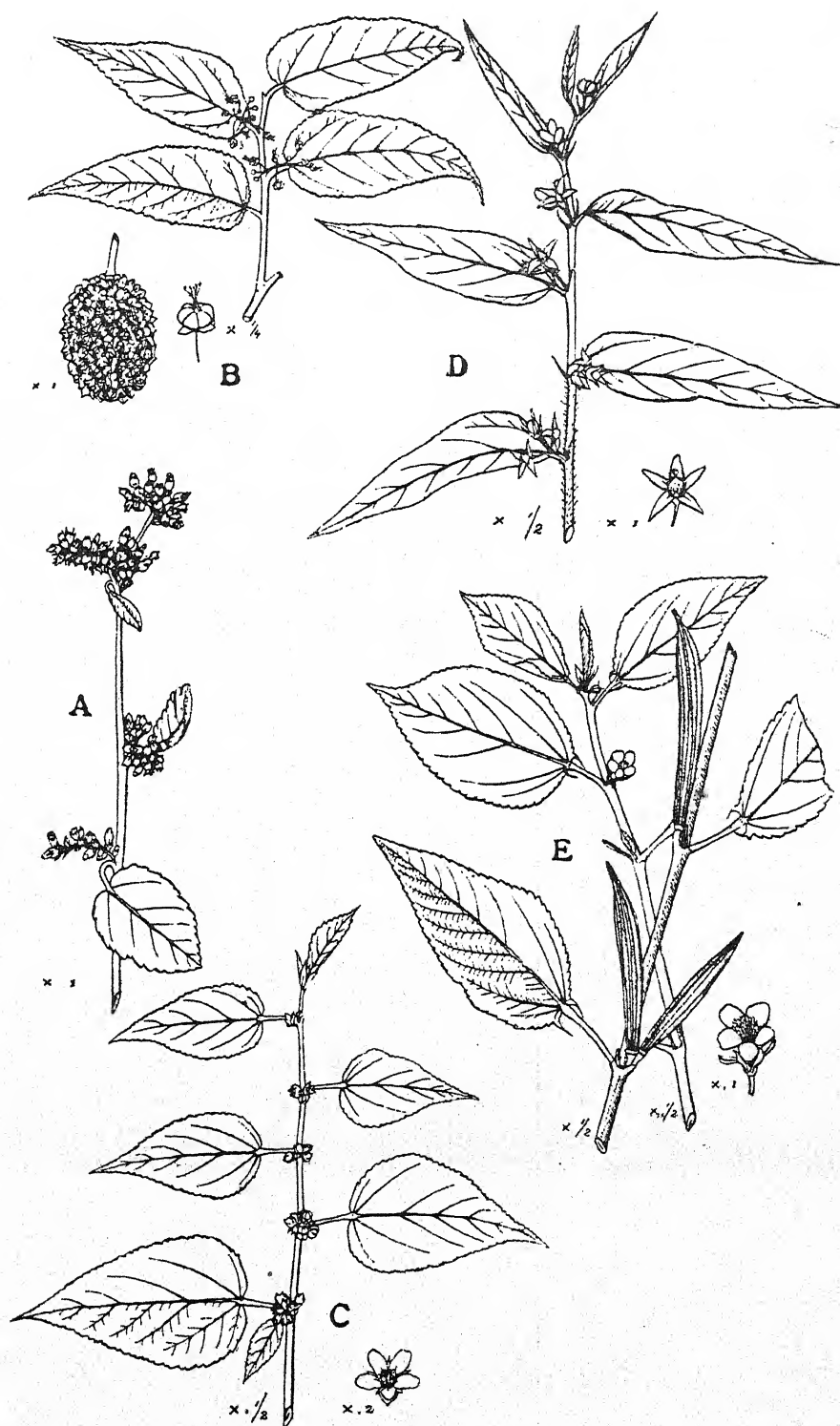
PLATE IV.

- A. *Malvastrum coromandelianum*.
- B. *Abutilon hirtum*.
- C. *Sida Schimperiana*.
- D. *Sida rhombifolia*.
- E. *Hibiscus micranthus*.
- F. *Hibiscus vitifolius*.



PLATE V.

- A. *Waltheria indica*.
- B. *Guazuma tomentosa*.
- C. *Melochia nodiflora*.
- D. *Grewia hirsuta*.
- E. *Corchorus olitorius*.



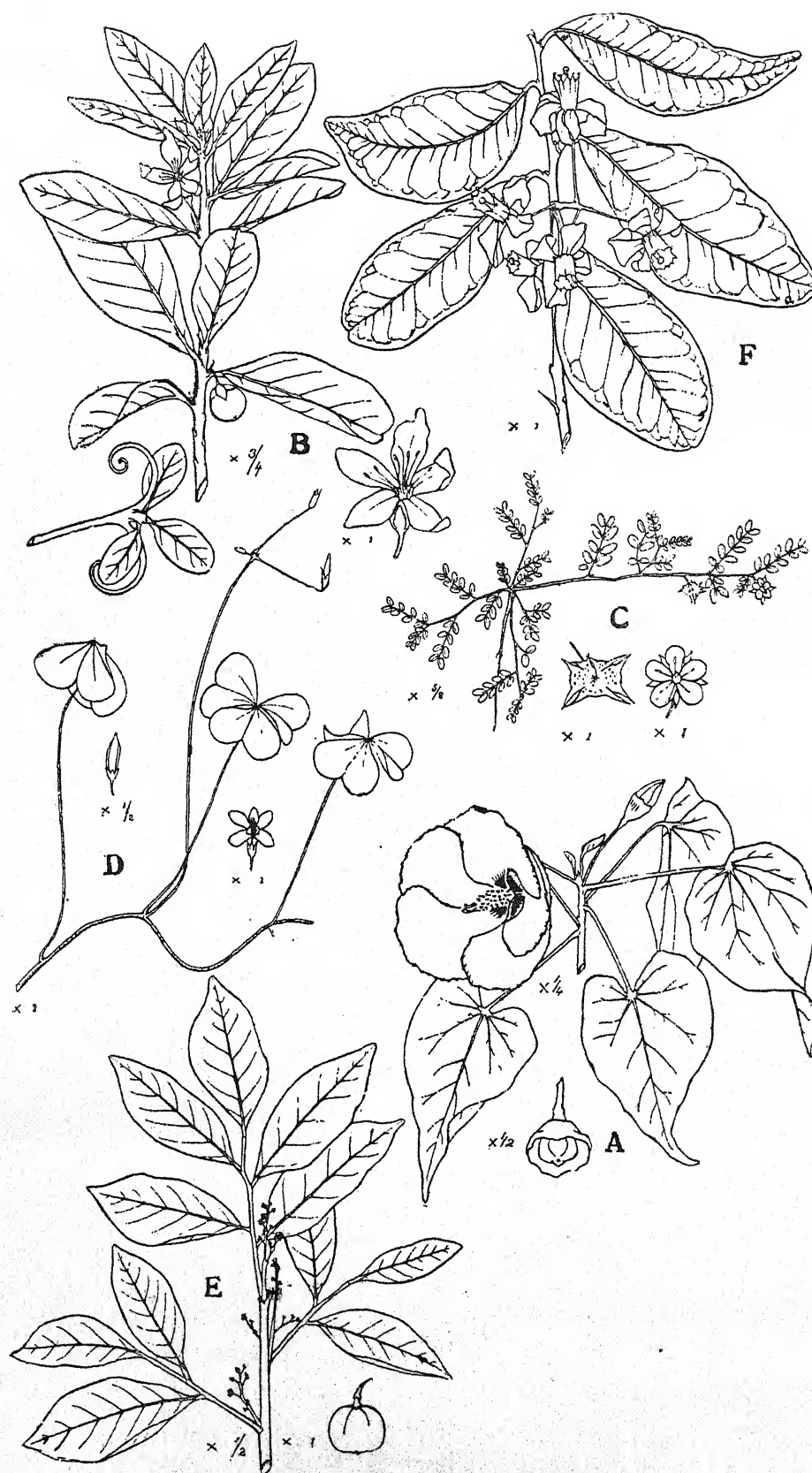


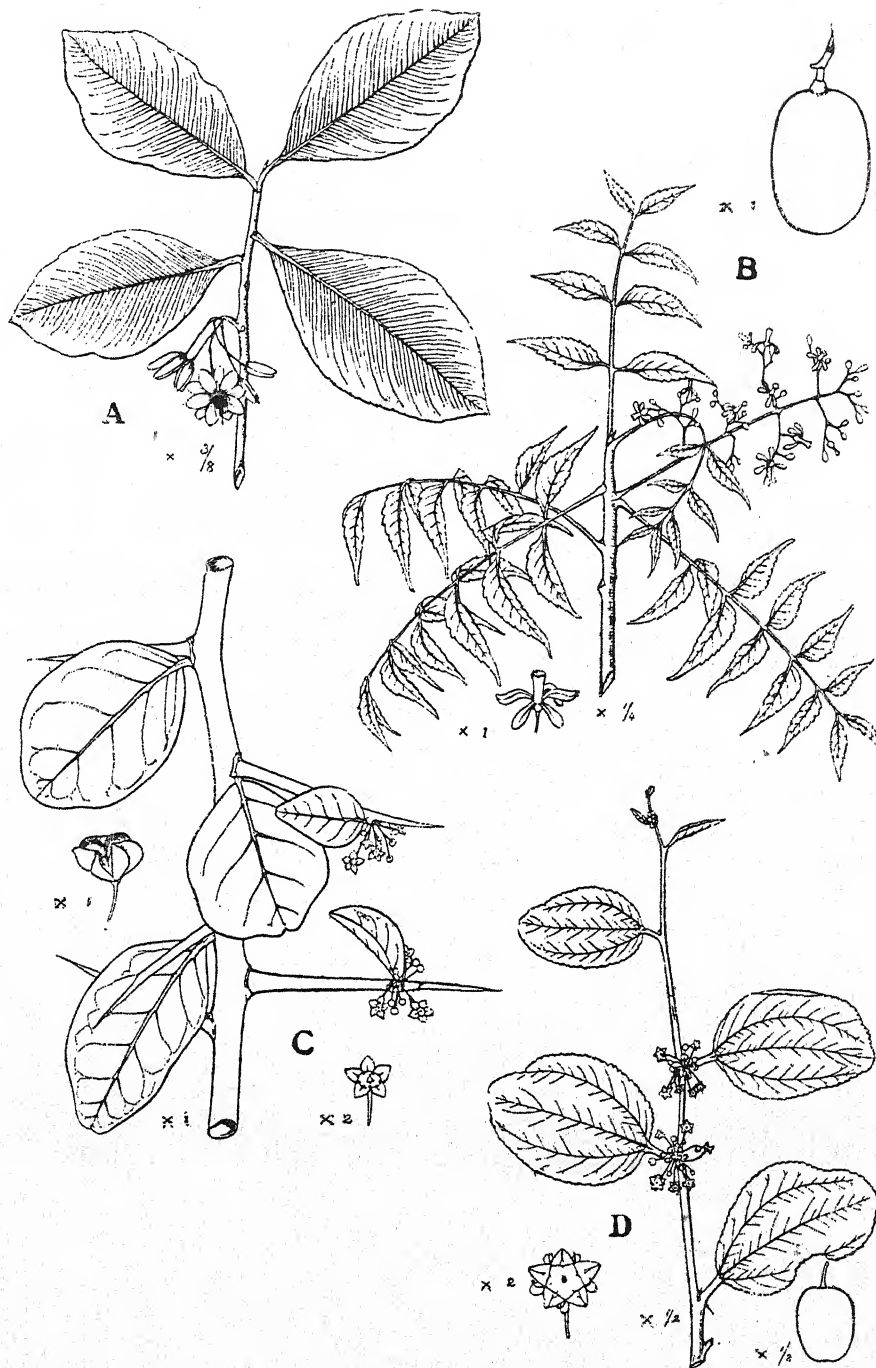
PLATE VI.

- A. *Thespesia populnea*.
- B. *Hugonia mystax*.
- C. *Tribulus terrestris*.
- D. *Oxalis corniculata*.
- E. *Glycosmis cochinchinensis*.
- F. *Atalantia monophylla*.



PLATE VII.

- A. *Ochna squarrosa*.
- B. *Azadirachta indica*.
- C. *Gymnosporia emarginata*.
- D. *Zizyphus Jujuba*.



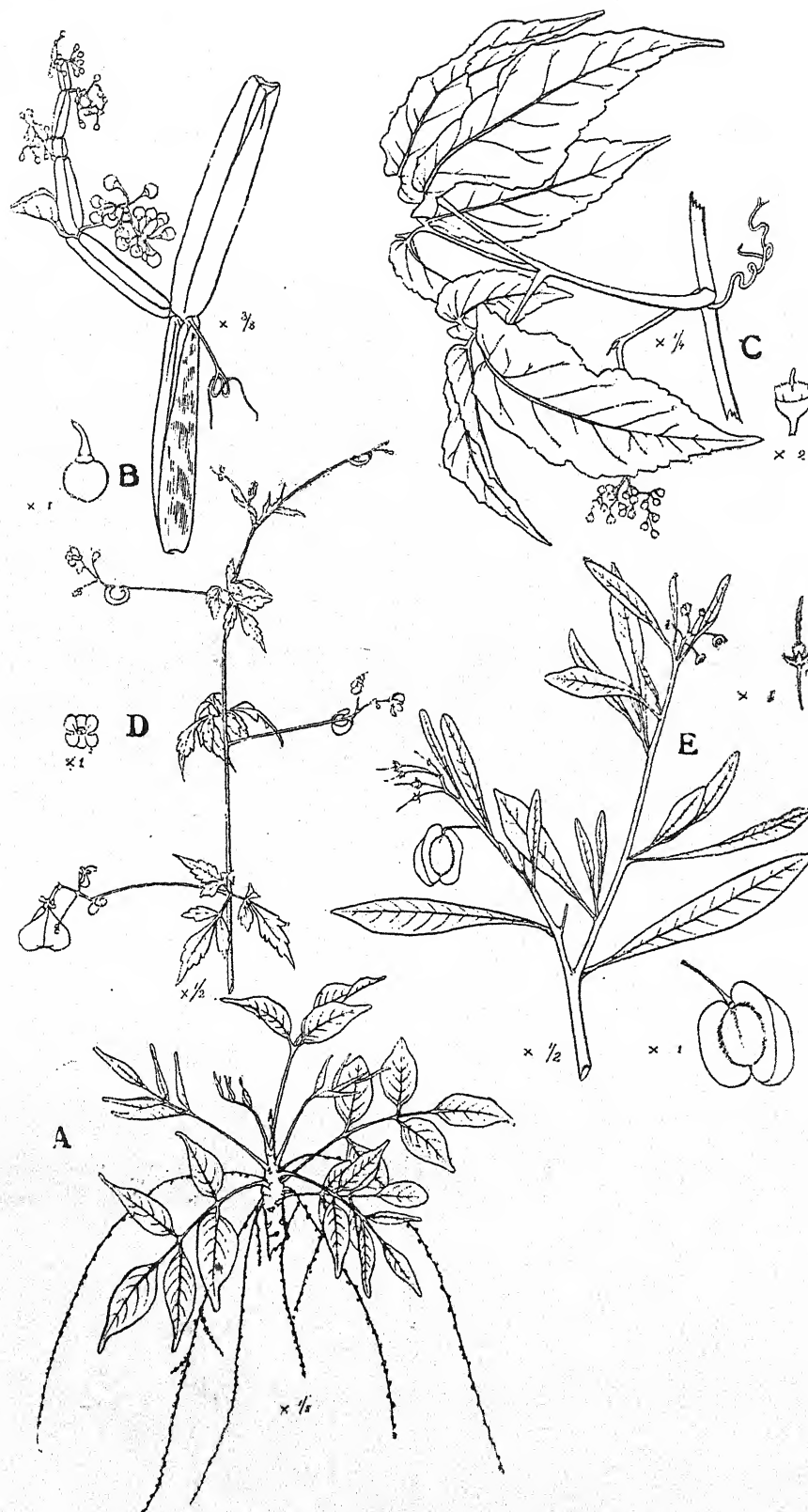


PLATE VIII.

- A. *Odina Wodier.*
- B. *Cissus quadrangularis.*
- C. *Cayratia pedata.*
- D. *Cardiospermum Halicacabum.*
- E. *Dodonaea viscosa.*



PLATE IX.

- A. *Crotalaria retusa*.
- B. *Canavalia linifolia*.
- C. *Clitoria Ternatea*.
- D. *Tephrosia villosa*.
- E. *Desmodium gangeticum*.

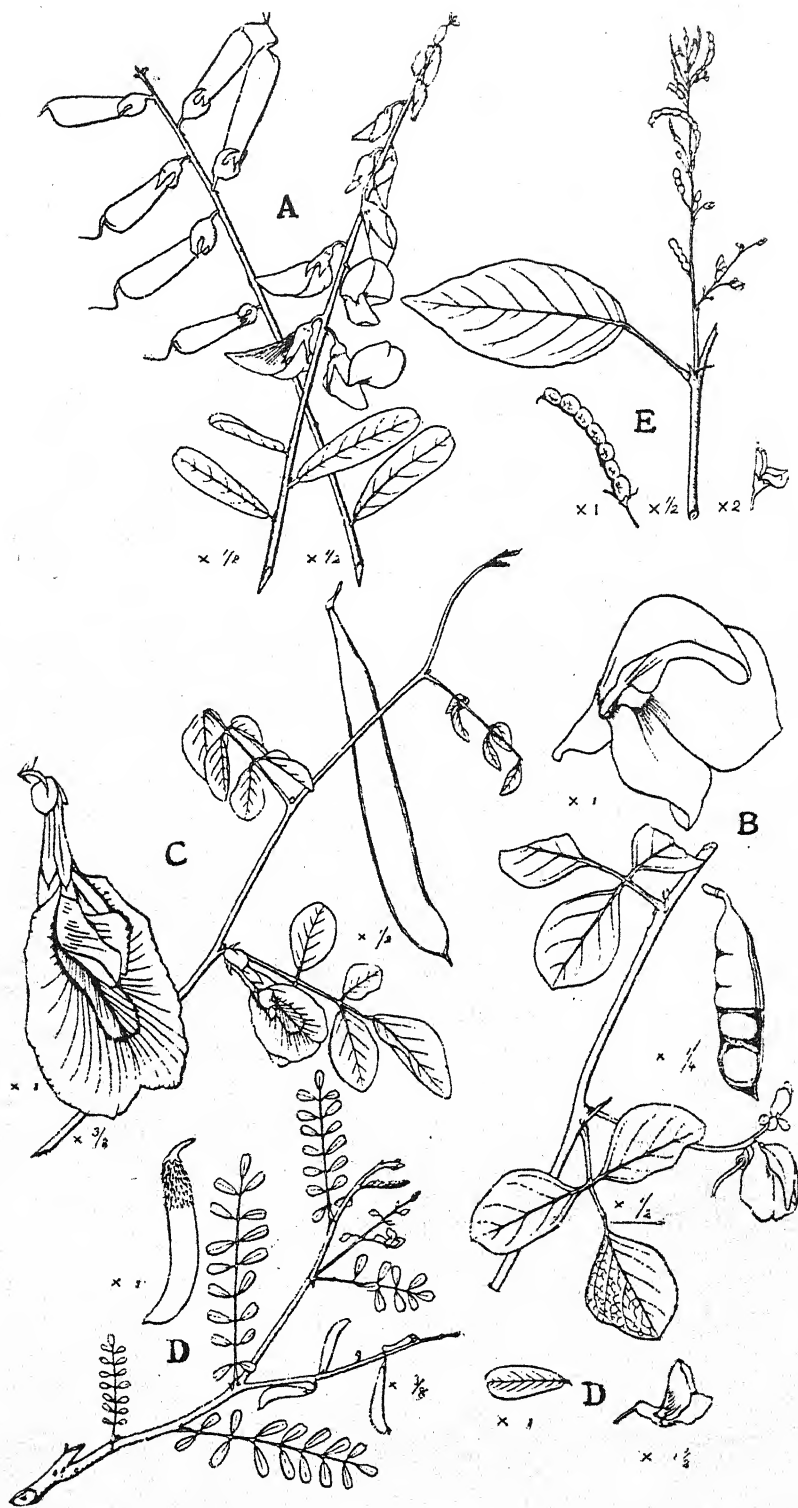


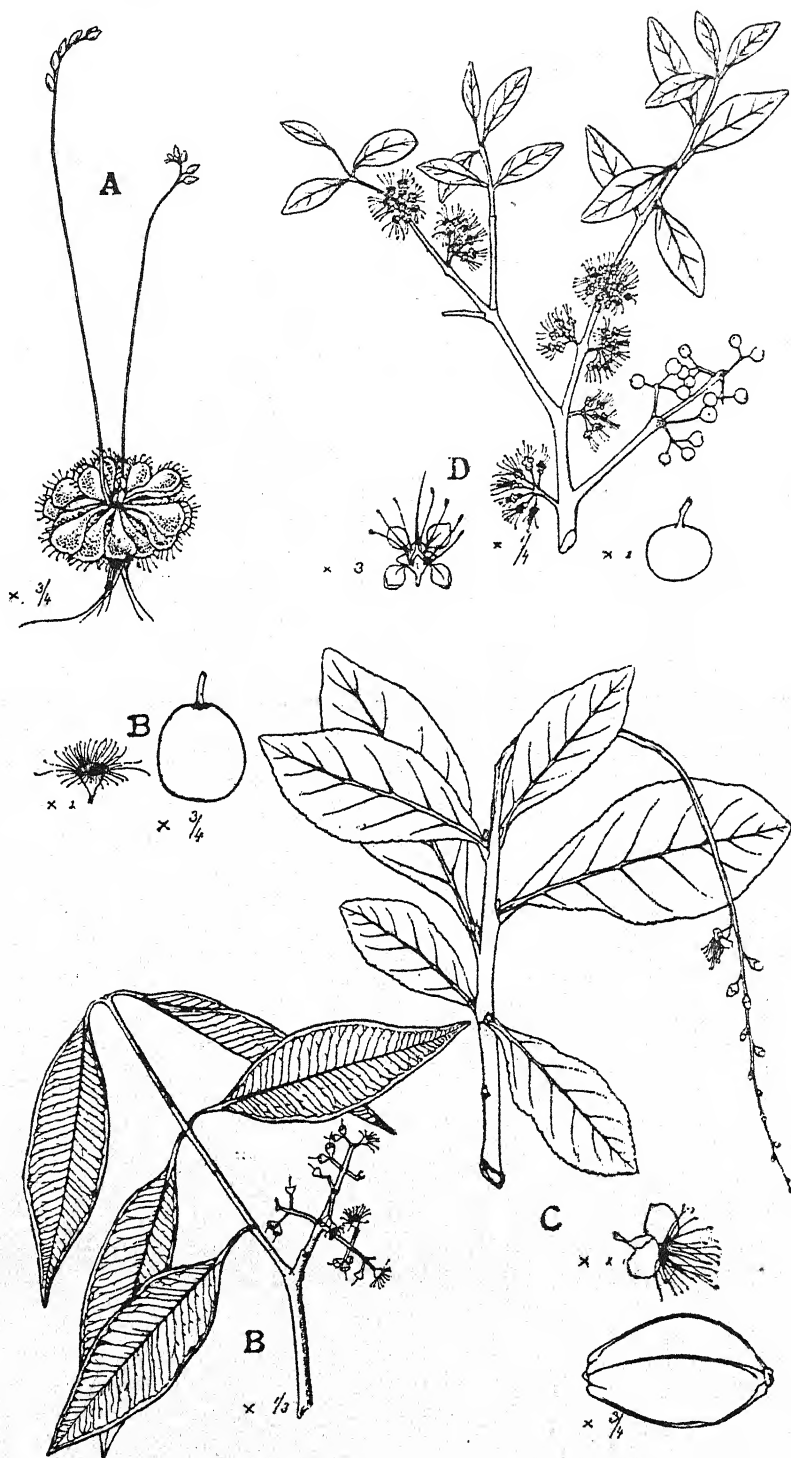


PLATE X.

- A. *Caesalpinia crista.*
- B. *Bauhinia tomentosa.*
- C. *Cassia Fistula.*
- D. *Neptunia oleracea.*
- E. *Prosopis spicigera.*

PLATE XI.

- A. *Drosera Burmanni*.
- B. *Syzygium Jambolanum*.
- C. *Barringtonia acutangula*.
- D. *Memecylon umbellatum*.



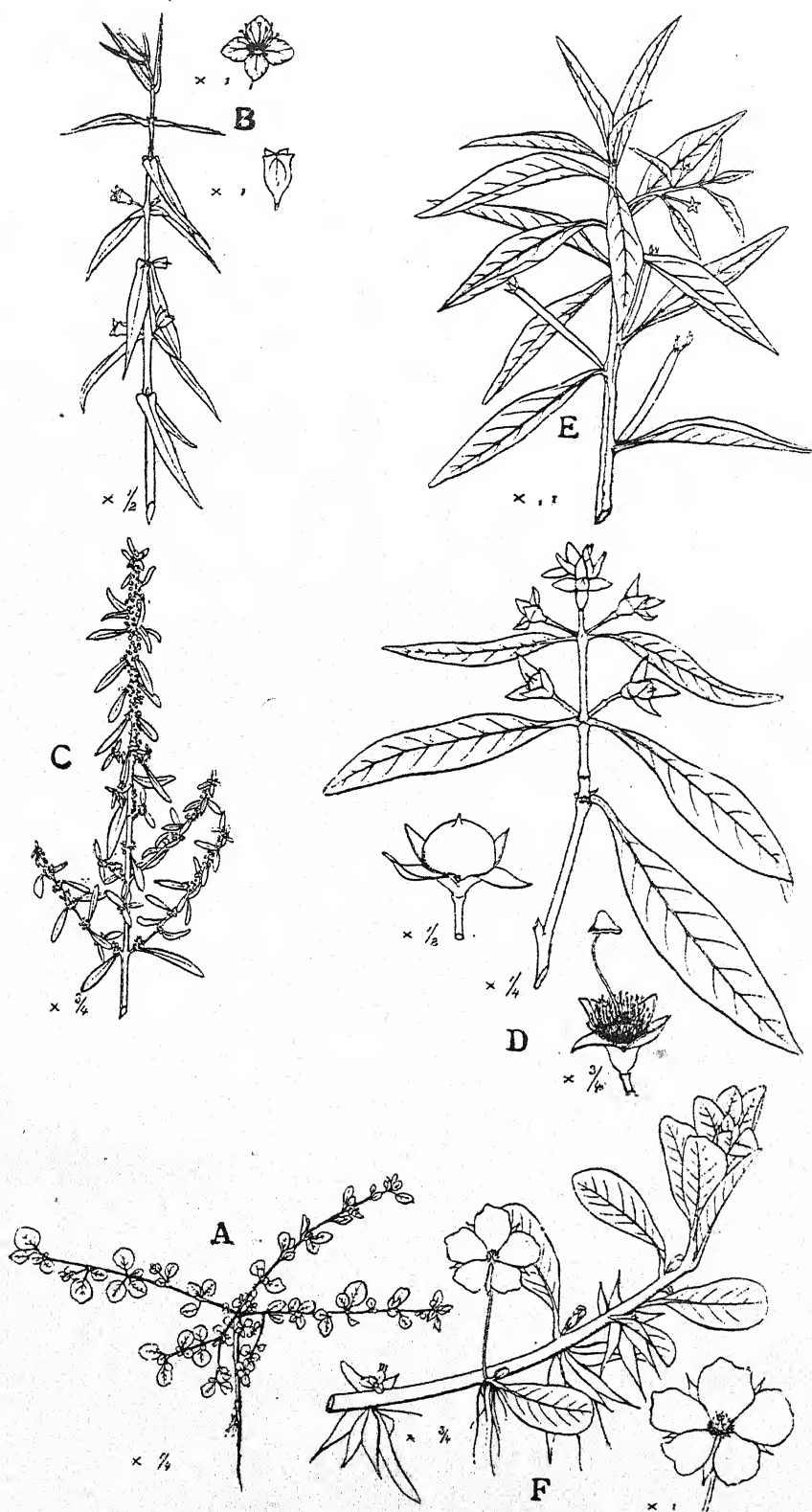


PLATE XII.

- A. *Rotala densiflora*.
- B. *Ammania octandra*.
- C. *Ammania baccifera*.
- D. *Sonneratia apetala*.
- E. *Ludwigia parviflora*.
- F. *Jussieua repens*.

PLATE XIII.

- A. *Vahlia viscosa*.
- B. *Turnera trioniflora*.
- C. *Passiflora foetida*.
- D. *Coccinia indica*.
- E. *Melothria maderaspatana*.



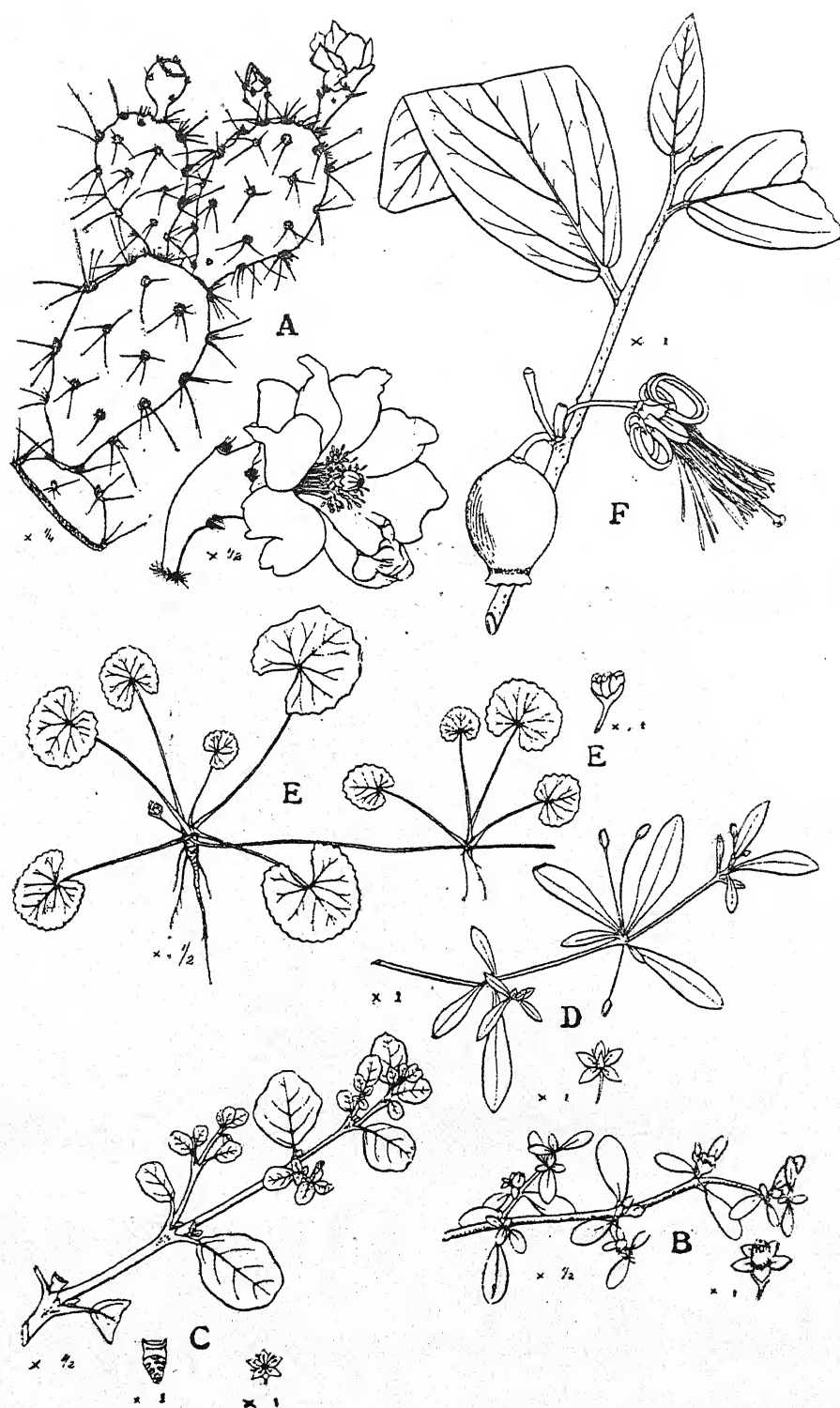


PLATE XIV.

- A. *Opuntia Dillenii*.
- B. *Sesuvium Portulacastrum*.
- C. *Trianthema Portulacastrum*.
- D. *Mollugo Cerviana*.
- E. *Centella asiatica*.
- F. *Alangium salvifolium*.

PLATE XV.

- A. *Oldenlandia umbellata*.
- B. *Pavetta indica*.
- C. *Morinda citrifolia*.
- D. *Hydrophylax maritima*.
- E. *Sphenoclea zeylanica*.



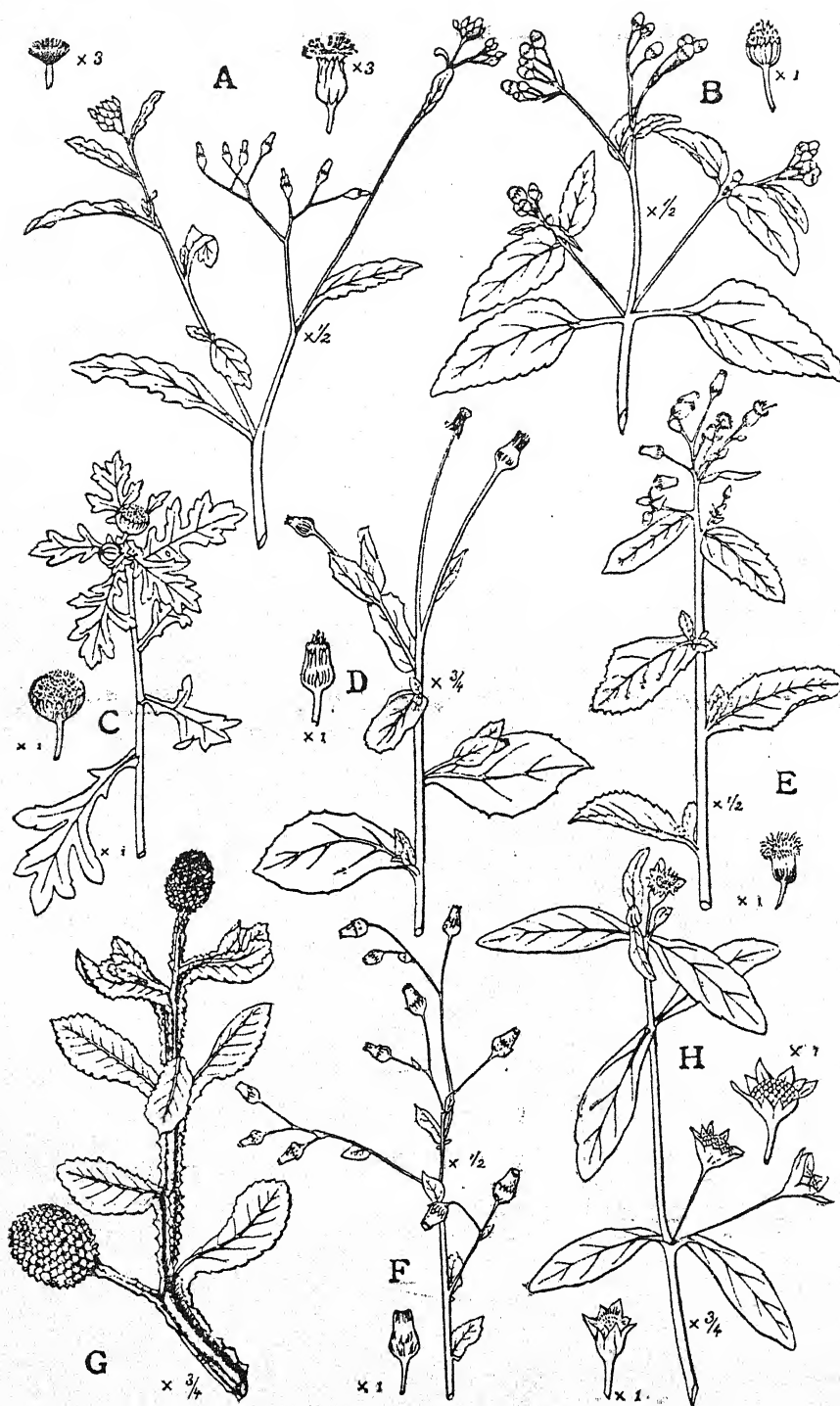


PLATE XVI.

- A. *Vernonia cinerea.*
- B. *Ageratum conyzoides.*
- C. *Grangea maderaspatana.*
- D. *Blumea bifoliata.*
- E. *Blumea Wightiana.*
- F. *Laggera aurita.*
- G. *Sphaeranthus indicus.*
- H. *Eclipta alba.*

PLATE XVII.

- A. *Synedrella nodiflora*.
- B. *Tridax procumbens*.
- C. *Flaveria australasica*.
- D. *Emilia sonchifolia*.
- E. *Lactuca runcinata*.





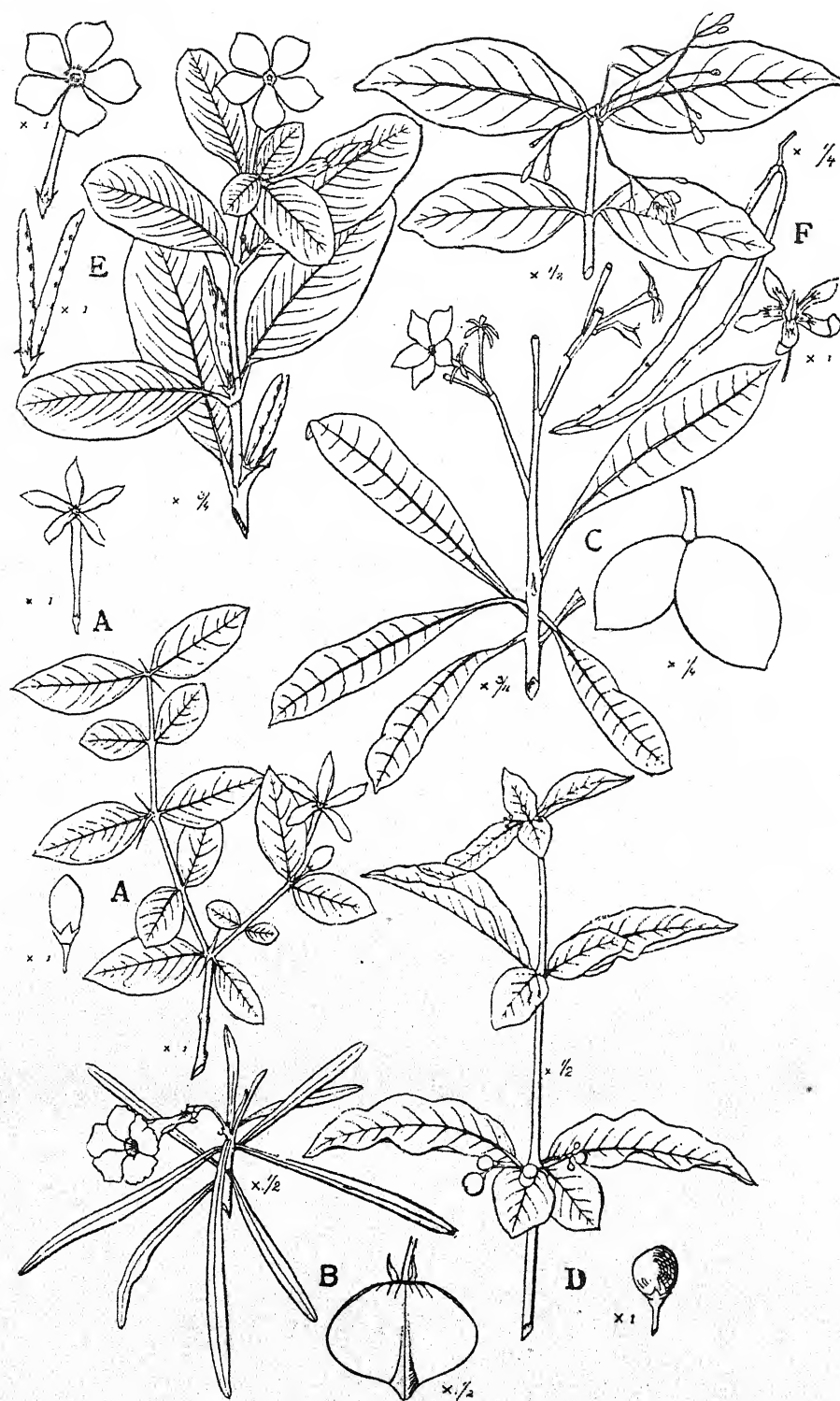


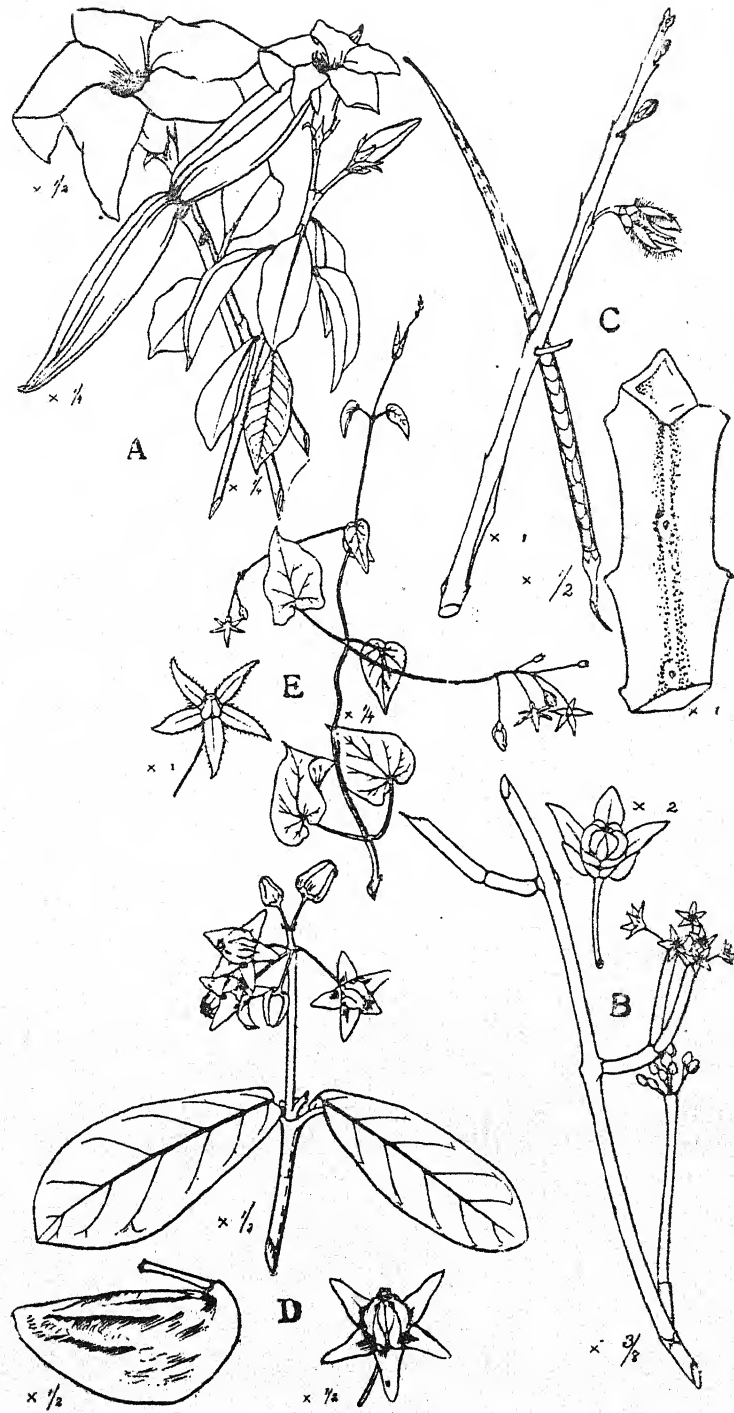
PLATE XVIII.

- A. *Carissa spinarum*.
- B. *Thevetia nerifolia*.
- C. *Cerbera manghas*.
- D. *Rauwolfia canescens*.
- E. *Lochnera rosea*.
- F. *Wrightia tinctoria*.



PLATE XIX.

- A. *Cryptostegia grandiflora*.
- B. *Sarcostemma brevistigma*.
- C. *Caralluma attenuata*.
- D. *Calotropis gigantea*.
- E. *Leptadenia reticulata*.



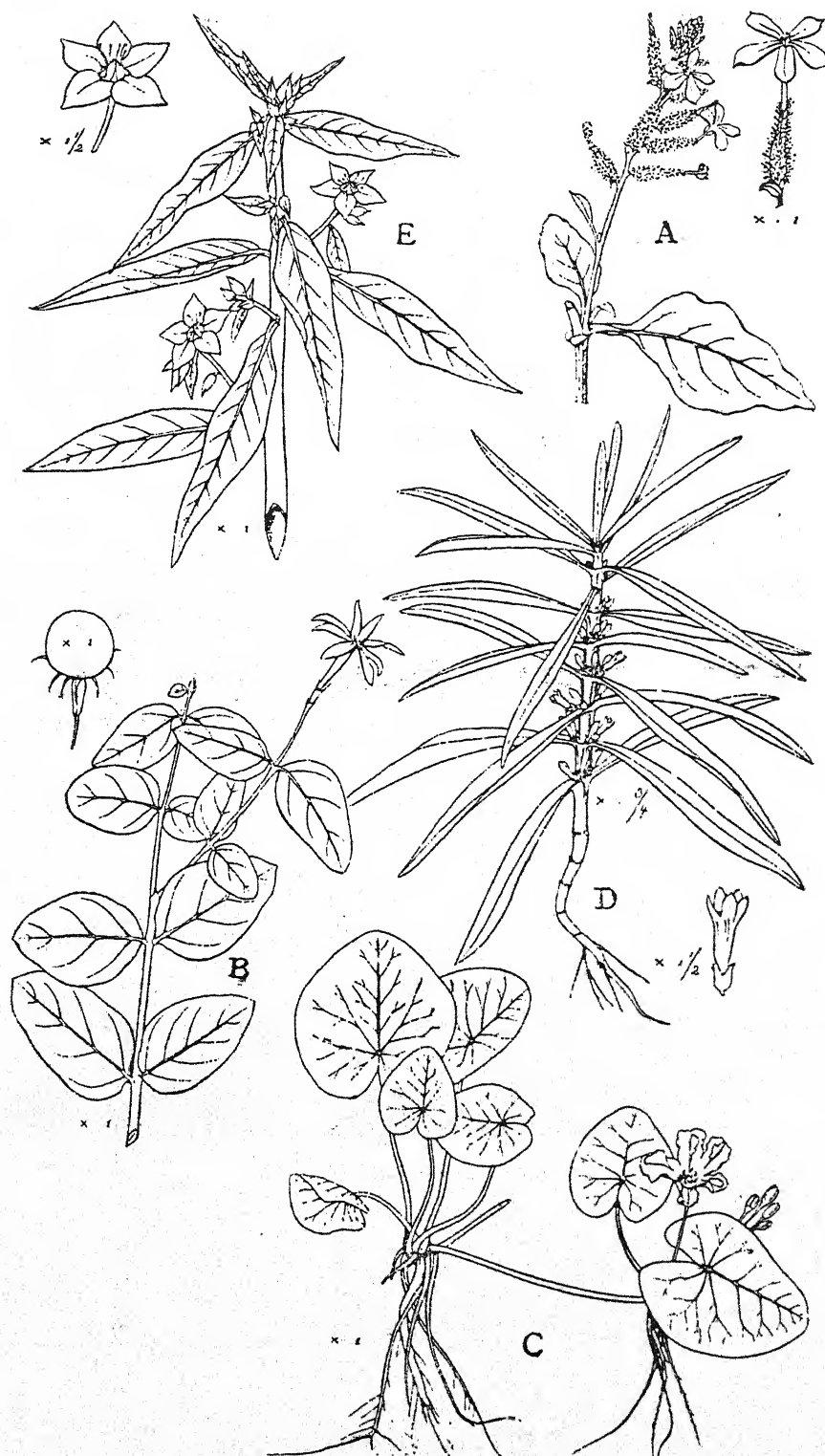


PLATE XX.

- A. *Plumbago zeylanica*.
- B. *Jasminum sessiliflorum*.
- C. *Limnanthemum cristatum*.
- D. *Enicostemma littorale*.
- E. *Hydrolea zeylanica*.



PLATE XXI.

- A. *Trichodesma amplexicaule*.
- B. *Cordia Rothii*.
- C. *Ehretia microphylla*.
- D. *Heliotropium indicum*.
- E. *Heliotropium curassavicum*.



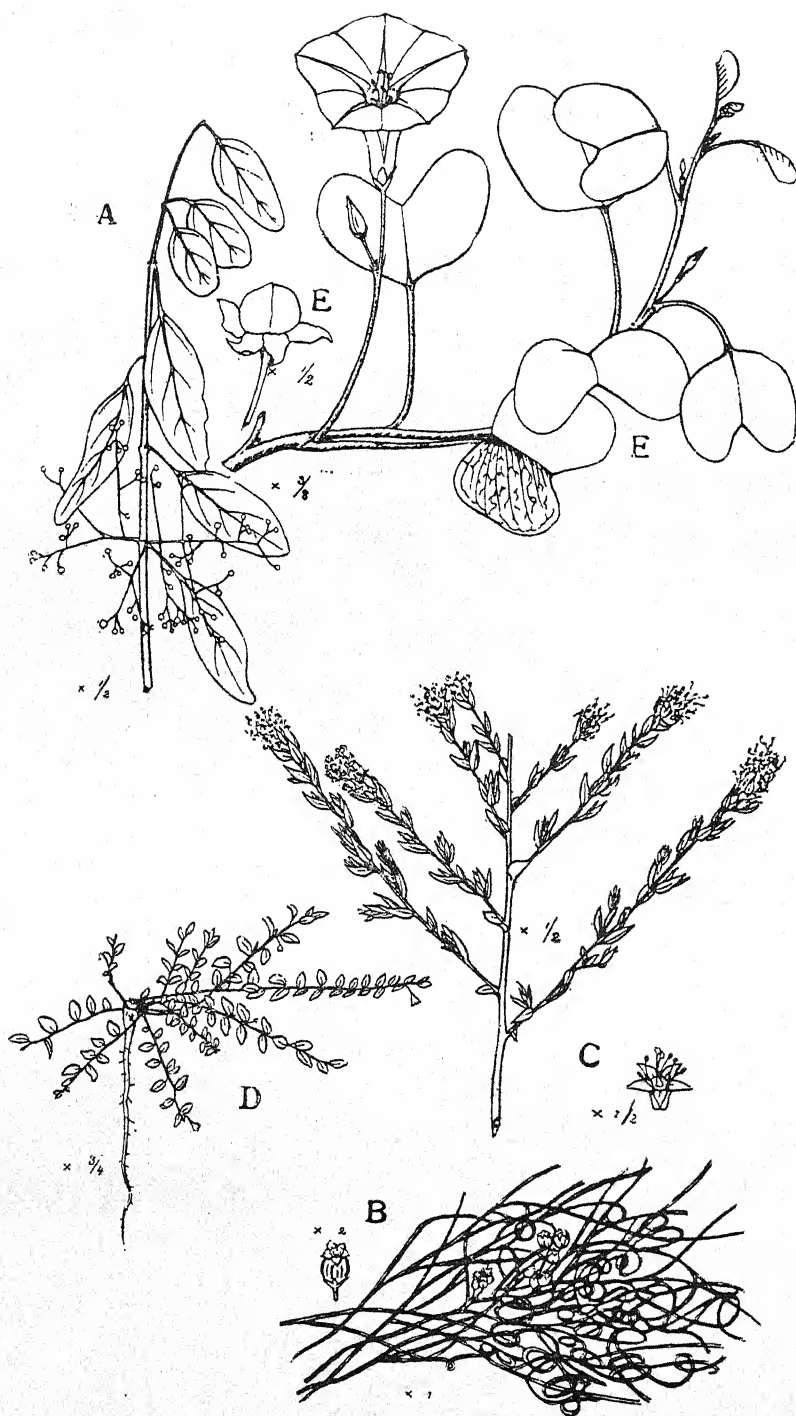


PLATE XXII.

- A. *Salvadora persica.*
- B. *Cuscuta chinensis.*
- C. *Cressa cretica.*
- D. *Evolvulus alsinoides.*
- E. *Ipomaea Pes-caprae.*

PLATE XXIII.

- A. *Mimusops Elengi.*
- B. *Datura fastuosa.*
- C. *Nicotiana plumbaginifolia.*
- D. *Solanum trilobatum.*
- E. *Physalis minima.*

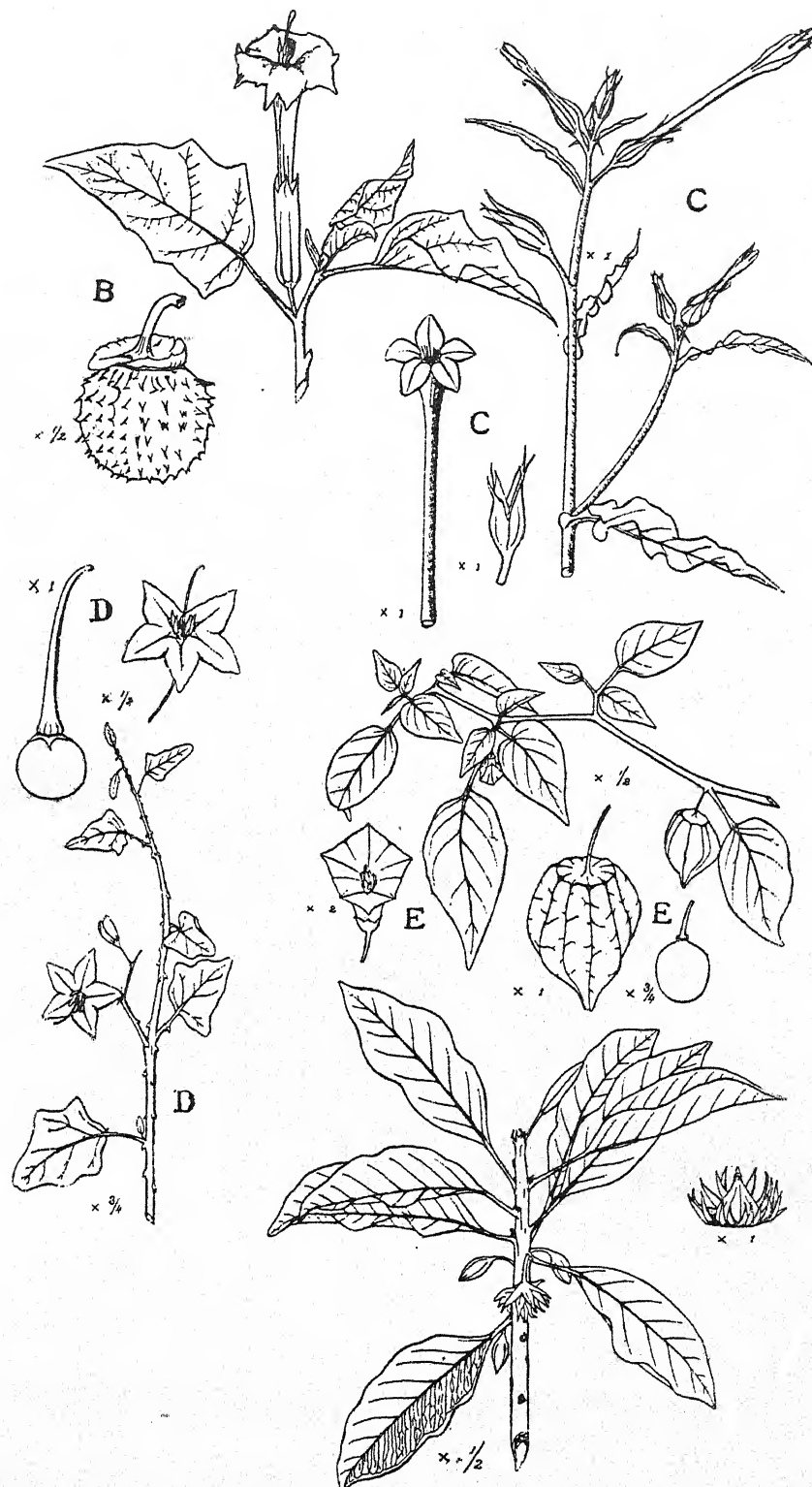




PLATE XXIV.

- A. *Maba buxifolia*.
- B. *Scoparia dulcis*.
- C. *Moniera cuneifolia*.
- D. *Vandellia crustacea*.
- E. *Sopubia delphinifolia*.

PLATE XXV.

- A. *Utricularia flexuosa*.
- B. *Sesamum prostratum*.
- C. *Pedaliium murex*.
- D. *Martynia annua*.
- E. *Millingtonia hortensis*.

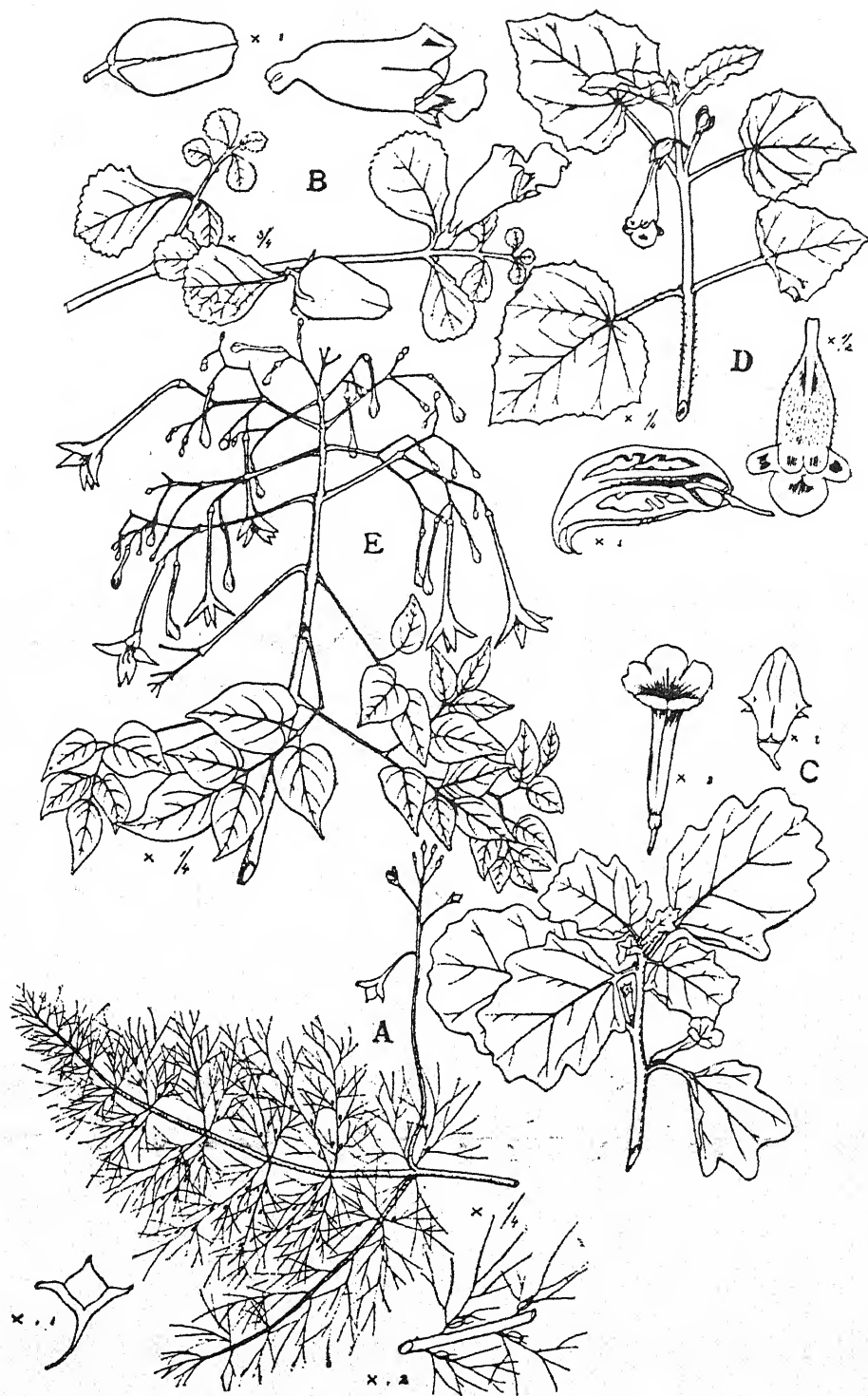


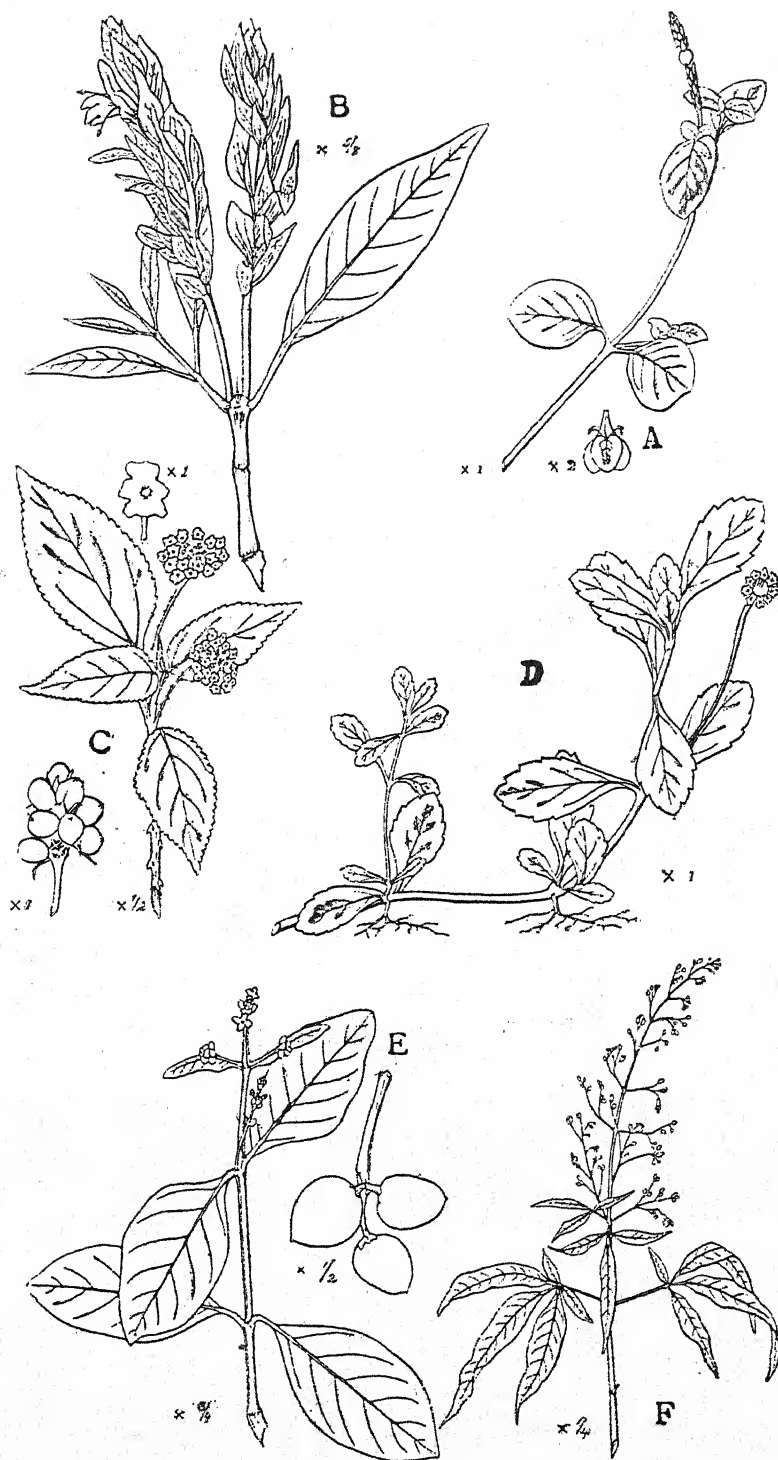


PLATE XXVI.

- A. *Asteracantha longifolia.*
- B. *Hygrophila angustifolia.*
- C. *Ruellia tuberosa.*
- D. *Andrographis echiioides.*
- E. *Barleria Prionitis.*
- F. *Asystasia gangetica.*

PLATE XXVII.

- A. *Justicia prostrata.*
- B. *Adhatoda Vasica.*
- C. *Lantana aculeata.*
- D. *Lippia nodiflora.*
- E. *Avicennia officinalis.*
- F. *Vitex Negundo.*



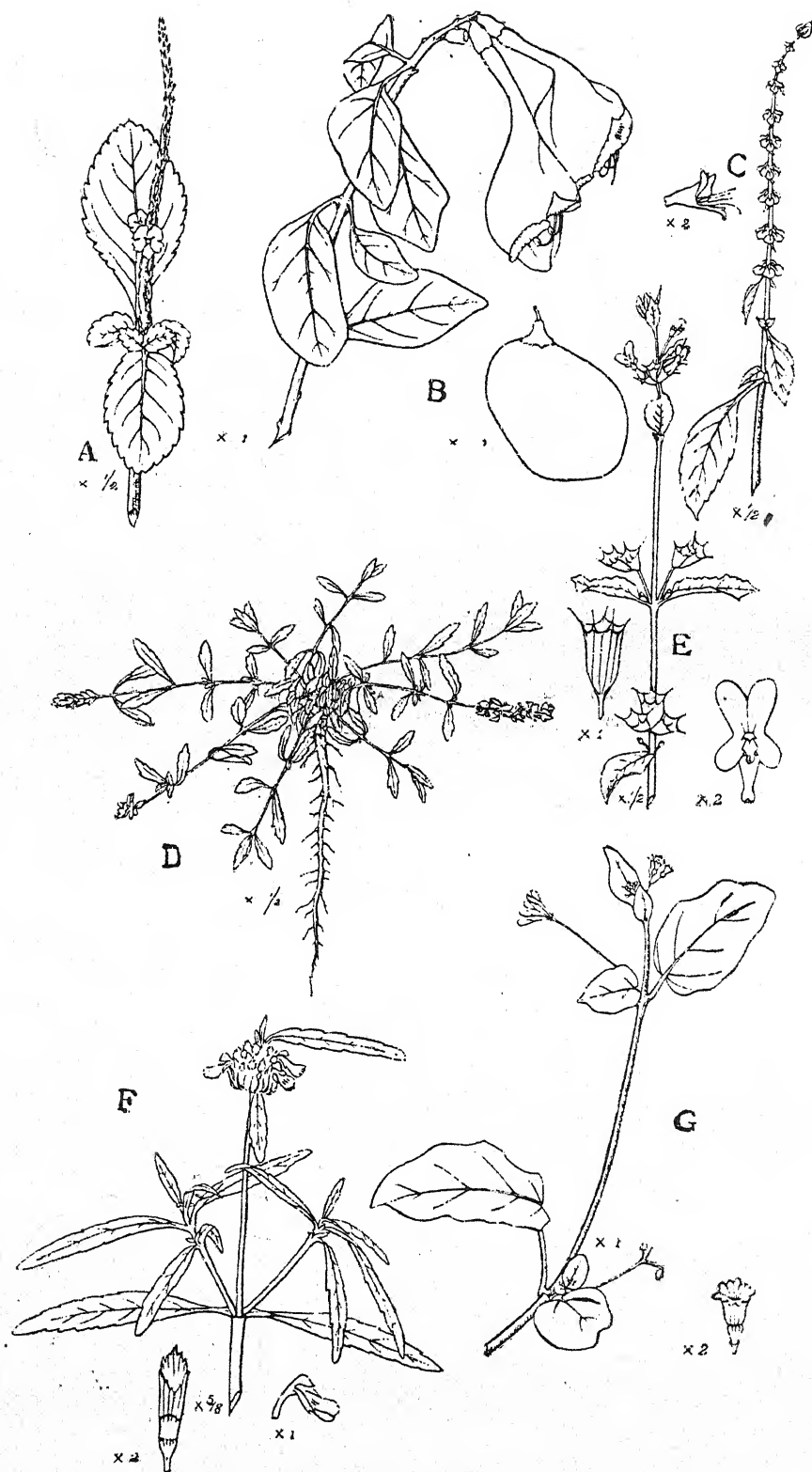


PLATE XXVIII.

- A. *Stachytarpheta indica.*
- B. *Gmelina asiatica.*
- C. *Ocimum canum.*
- D. *Geniosporum prostratum.*
- E. *Hyptis suaveolens.*
- F. *Leucas aspera.*
- G. *Boerhaavia diffusa.*

PLATE XXIX.

- A. *Amarantus spinosus*.
- B. *Achyranthes aspera*.
- C. *Nothosaerva brachiata*.
- D. *Alternanthera triandra*.
- E. *Gomphrena decumbens*.
- F. *Cassytha filiformis*.





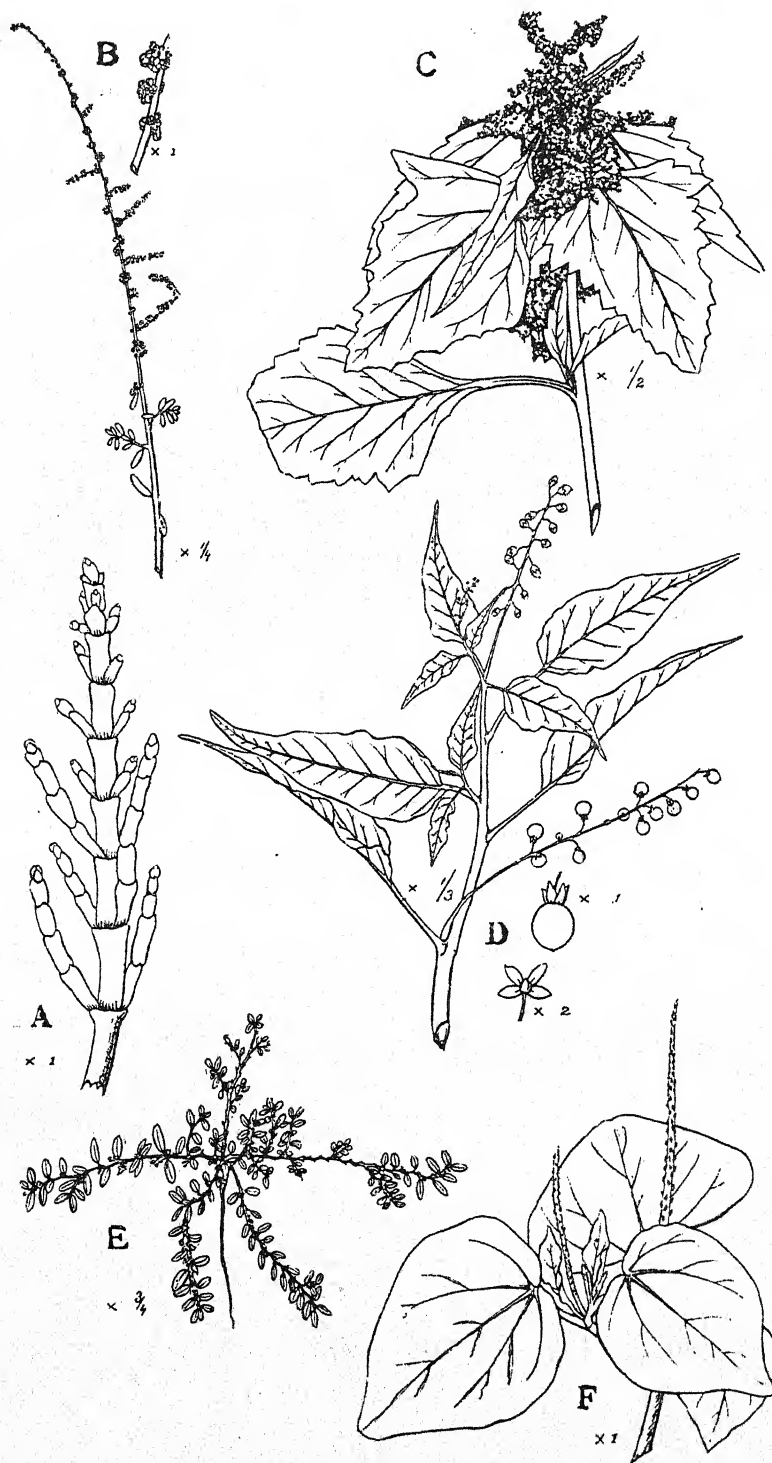


PLATE XXX.

- A. *Arthrocnemum indicum.*
- B. *Suaeda maritima.*
- C. *Chenopodium murale.*
- D. *Rivinia humilis.*
- E. *Polygonum plebejum.*
- F. *Peperomia pellucida.*

PLATE XXXI.

- A. *Euphorbia antiquorum*.
- B. *Euphorbia hirta*.
- C. *Phyllanthus maderaspatensis*.
- D. *Croton sparsiflorus*.
- E. *Acalypha indica*.
- F. *Tragia involucrata*.
- G. *Excoecaria Agallocha*.

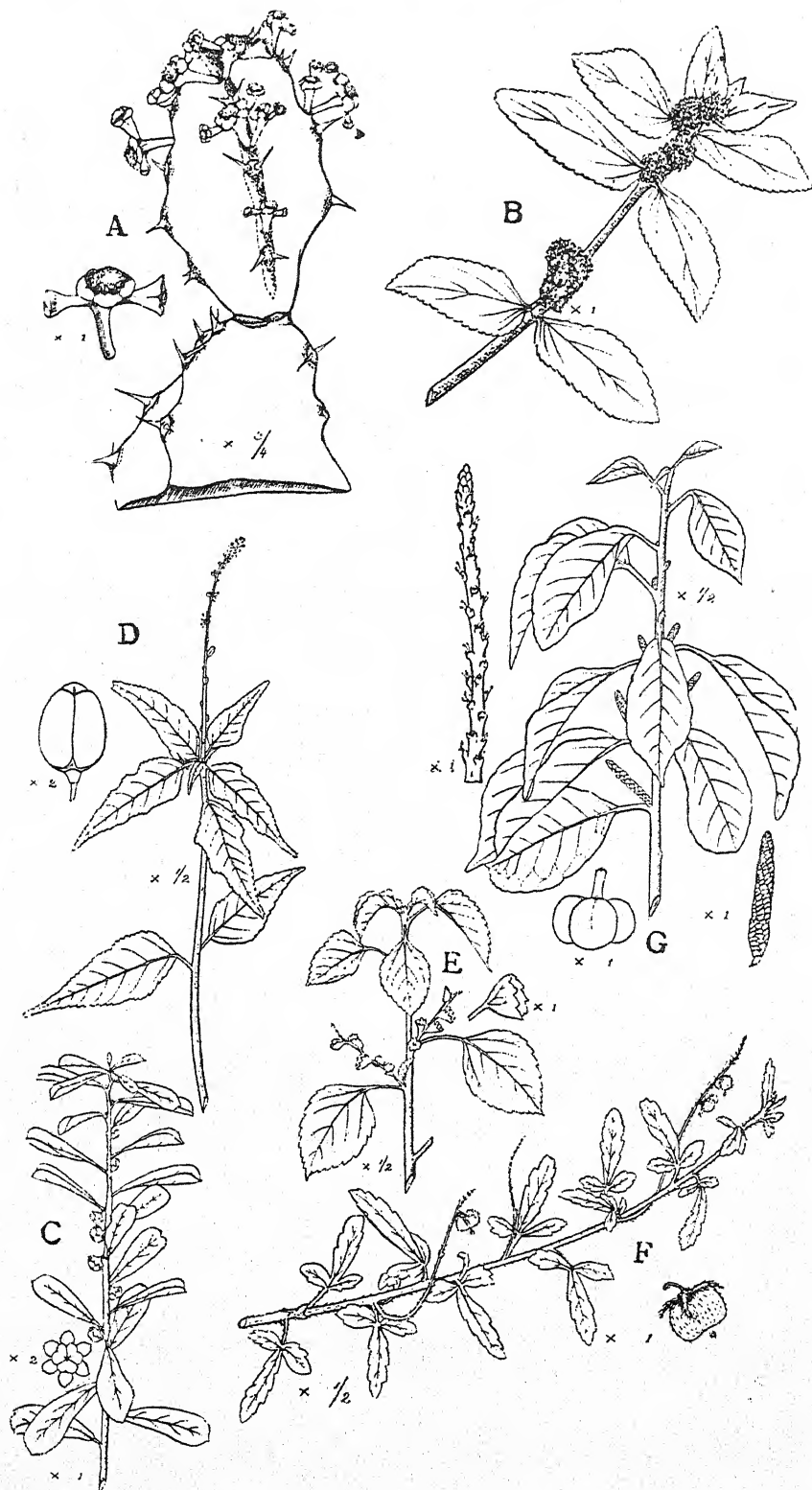




PLATE XXXII.

- A. *Aristolochia indica*.
- B. *Santalum album*.
- C. *Ficus hispida*.
- D. *Casuarina equisetifolia*.
- E. *Ceratophyllum demersum*.

PLATE XXXIII.

- A. *Hydrilla verticillata*.
- B. *Ottelia alismoides*.
- C. *Vallisneria spiralis*.
- D. *Aponogeton monostachyon*.





PLATE XXXIV.

- A. *Sansiviera Roxburghiana*
- B. *Crinum defixum.*
- C. *Asparagus racemosus.*
- D. *Gloriosa superba.*



PLATE XXXV.

- A. *Cyanotis axillaris*.
- B. *Commelina benghalensis*.
- C. *Commelina paleata*.
- D. *Aneilema nudiflorum*.



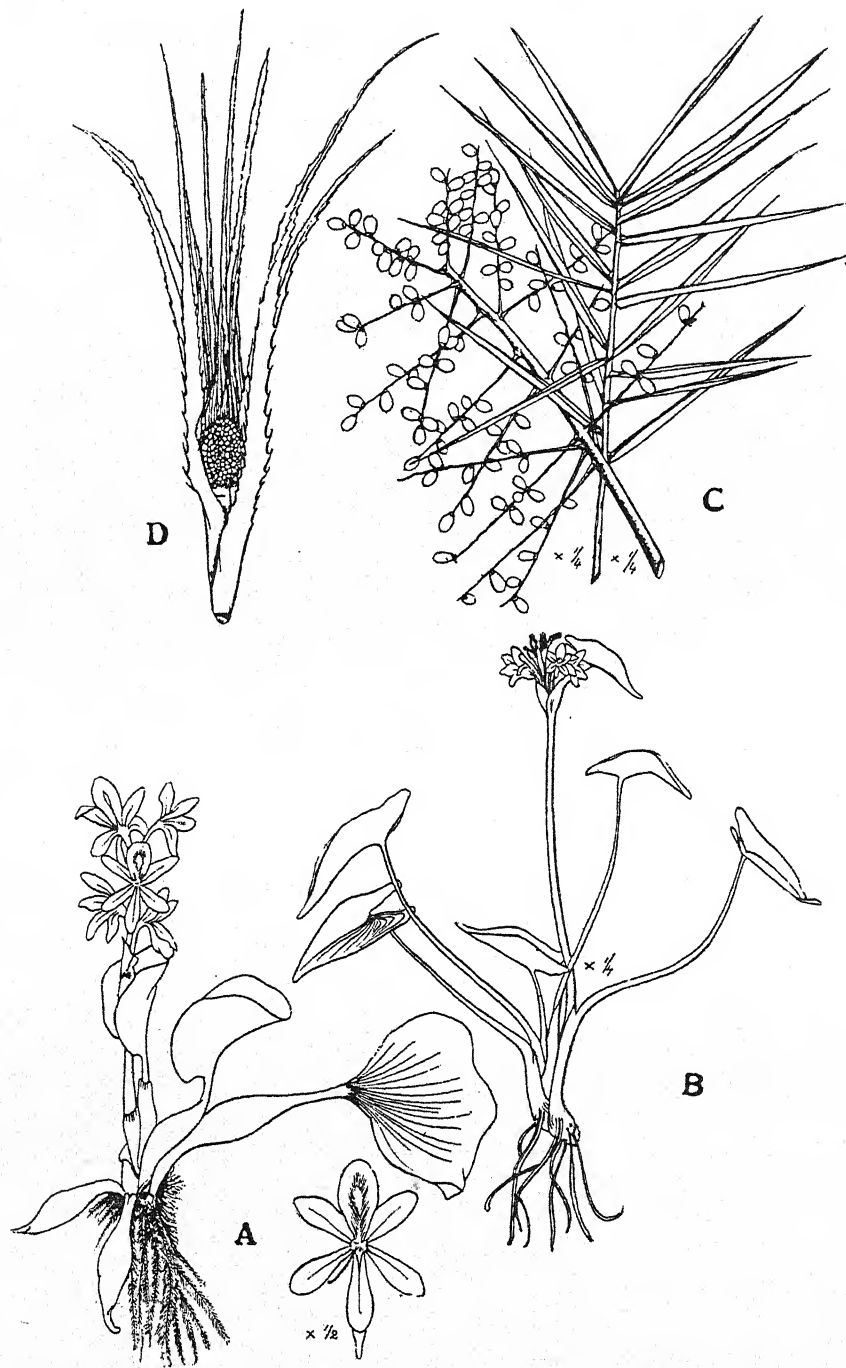
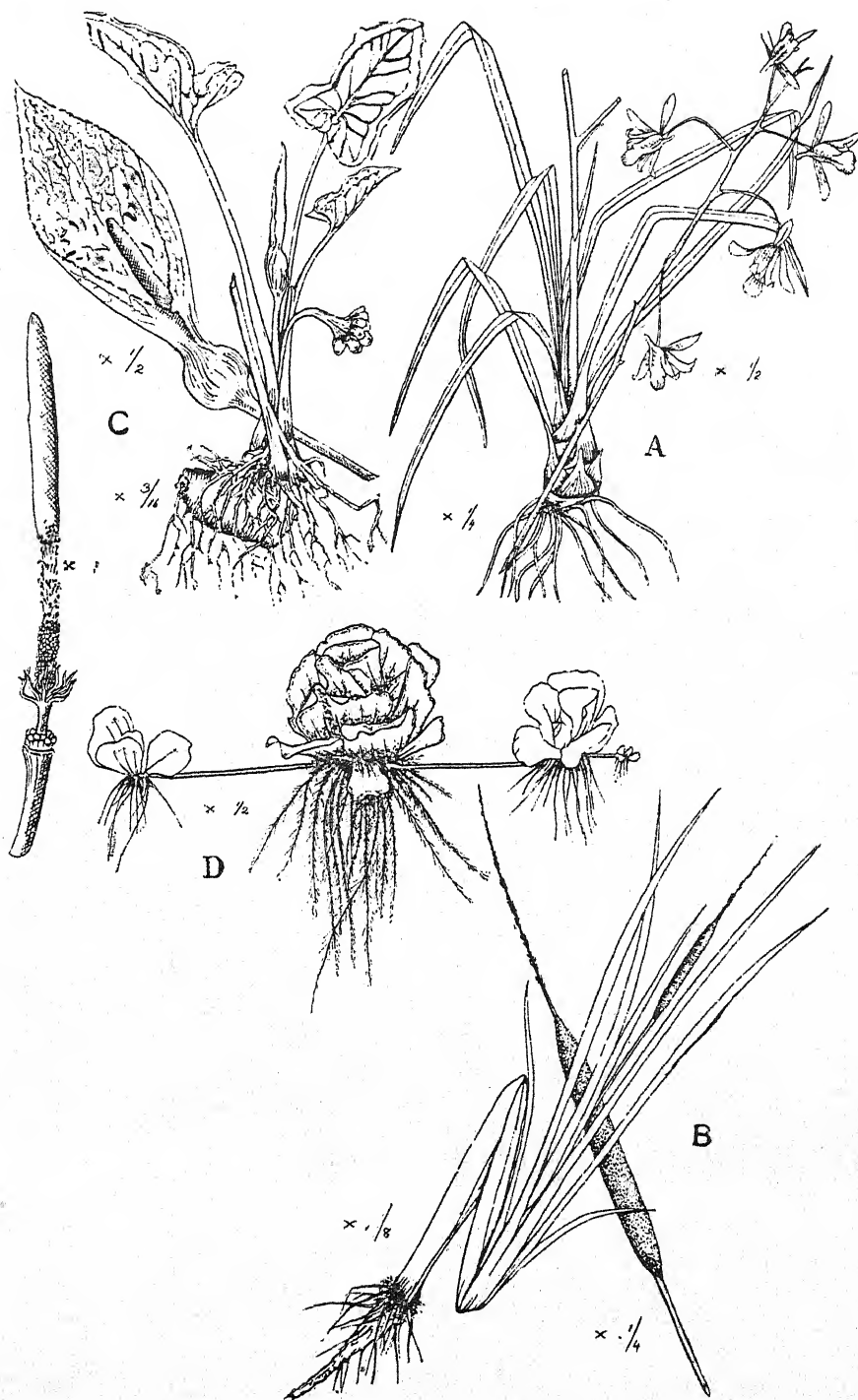


PLATE XXXVI.

- A. *Eich hornia crassipes.*
- B. *Monochoria vaginalis.*
- C. *Phoenix humilis.*
- D. *Pandanus tectorius.*

PLATE XXXVII.

- A. *Eulophia epidendrea*.
- B. *Typha angustata*.
- C. *Typhonium divaricatum*.
- D. *Pistia Stratiotes*.



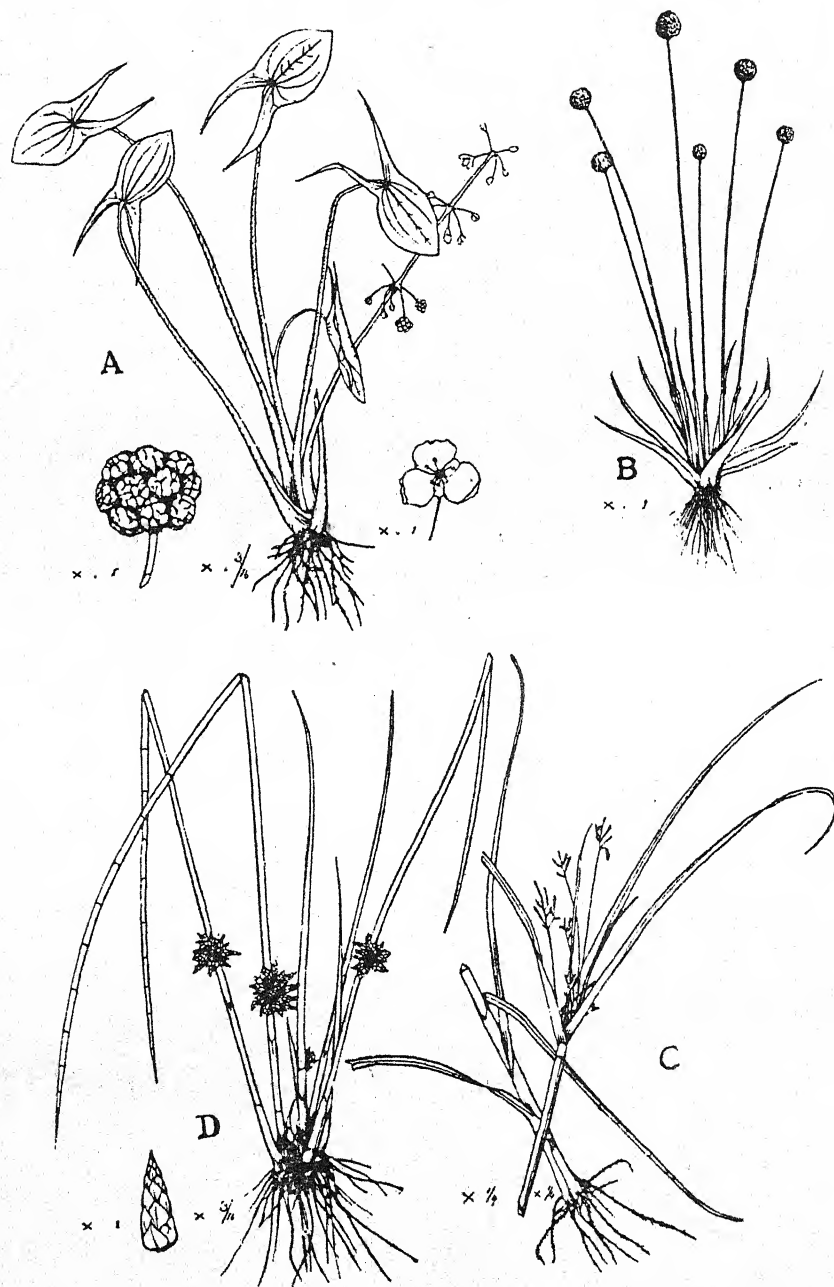


PLATE XXXVIII.

- A. *Limnophyton obtusifolium*.
- B. *Eriocaulon Sieboldianum*.
- C. *Cyperus rotundus*.
- D. *Scirpus articulatus*.

SUPPLEMENT TO THE FLOWERING PLANTS OF
MADRAS CITY AND ITS IMMEDIATE
NEIGHBOURHOOD

BY

E. BARNES, B.Sc.

Madras Christian College, Tambaram

(Published—June 1938)

INTRODUCTION

IN 1929 there was no flora confined to the region round Madras City and only part of Gamble's Flora of the Presidency of Madras had been published. Consequently it was almost impossible for teachers, students and other interested non-specialists to identify most of the plants of the district. The Flora of Madras City was published in order to remove this difficulty. It was produced as the result of several years of study of the local flora, both on the field and in the herbarium in the Madras Museum. That it has been found not to be exhaustive was to be expected; indeed, its chief value is probably that it forms a valuable starting point for the more complete study of the local flora. The writer of the present notes has, with its help, made observations for some years on the flora of the district immediately to the south of Madras City, chiefly in the Tambaram region. This area is now easily accessible from the city by electric train, and has itself become an educational centre. This supplement contains a description of 50 species and several varieties not included in the previous publication. A number of these plants are of special interest in that they have not previously been recorded from the East Coast. It appears that much still remains to be done before even the flowering plants of the district are completely listed; there are, in fact, a number of plants reported in the Flora of the Madras Presidency as occurring near the city of Madras which are not included in the Flora of Madras City. It is hoped that further supplements, including one containing the grasses and ferns, will appear, and that eventually the area may be extended so as to include the whole of the Chingleput district. The present notes, however, do not extend the area covered.

In the Flora of Madras City a number of the descriptions are found to be too brief to give the amateur a sense of certainty in his identification. In this supplement, therefore, the descriptions are much more detailed, and with few exceptions they are of the living plant as found in this district. It is hoped that the student will thus be left with little doubt as to the identity of any of these plants that he may find.

The construction of a complete key for the identification by a non-specialist of the families and aberrant genera of all plants found in this area is a matter of considerable difficulty, and it is felt that in some parts the keys in the Flora of Madras City are not altogether satisfactory. No attempt has, however, been made to remodel these keys and to incorporate in them the plants in this supplement, as it is thought that this can be done more usefully when further supplements have made the list more nearly complete. Instead of a supplementary key the present volume contains, on pages 1 to 9, a series of notes which show how the additional plants can be distinguished from those included in the main volume. The differences used in these notes are not necessarily the most important scientific distinctions but are differences in characters that are easily observed. If reference

to the main volume has failed to lead to the complete identification of the plant, it will probably have indicated the genus or family to which it belongs. Reference should then be made to the notes on pages 1 to 9 of this supplement. The arrangement of these notes is based on the same system of classification as was used in the main volume, and the number of the page of the Flora of Madras City to which the student will probably have been led is printed in heavy type. It should, therefore, be a simple matter to extend the search from the main volume to this supplement. The page numbers in brackets after the plant names in these notes refer to the present volume and indicate where a description of the plant will be found ; the numbers followed by F.M.C. refer to the main volume of the Flora of Madras City (Bulletin N.H. II, 1929). In every case, after the use of these notes or keys, the plant should be compared with the description of the plant for as many characters as possible. Specimens of most of the plants described in this supplement have been identified at Kew and are kept for reference at the Christian College at Tambaram as well as in the Madras Museum. The general descriptions of families and genera are taken from the Flora of Madras Presidency but are slightly simplified ; those already found in the main volume are not repeated.

NOTES FOR DISTINGUISHING THE PLANTS DESCRIBED IN THIS
SUPPLEMENT FROM THOSE INCLUDED IN THE MAIN VOLUME
OF THE FLORA OF MADRAS CITY (BULLETIN N.H. Vol. II, 1929)

(Page numbers in heavy type refer to the main volume, those in brackets to this
volume)

DICOTYLEDONS

Portulacaceae

Portulaca Wightiana, Wall. (p. 10)

This plant differs from the species of *Portulaca* described on page 33, F.M.C., in having its stems covered with white lanceolate acuminate chaffy scales.

Tiliaceae

Grewia rotundifolia, Juss. (p. 10)

This plant differs from the species described on pages 52 and 53, F.M.C., in having broad 5-ribbed leaves grey-tomentose beneath, and 3-flowered peduncles several times as long as the petioles.

Leguminosae-Papilionatae

Crotalaria biflora, Linn. (p. 11)

In the key on page 83, F.M.C., this plant traces down to *C. prostrata*. It can be distinguished from the latter plant by its pod which is sub-globose and covered sparsely with long hairs, and by its peduncles which have not more than two flowers. *C. prostrata* has oblong glabrous pods and peduncles with up to 4 flowers.

Sesbania procumbens, W. & A. (p. 11)

This plant differs from the three species of *Sesbania* mentioned on page 90, F.M.C., in being a prostrate plant with flowers less than .5 inch long.

Atylosia scarabaeoides, Benth. (p. 12)

In the key to the genera of *Papilionatae* on pages 74-76, F.M.C., this plant traces down to 25. *Atylosia* differs from *Phaseolus* and *Dolichos* in having styles which are not bearded below the stigma.

Rhynchosia rufescens, DC. (p. 12)

Rhynchosia suaveolens, DC. (p. 13)

Rhynchosia cana, DC. (p. 13)

In place of the key for the species of *Rhynchosia* given on page 87, F.M.C., the following should be used :—

1	Seeds without a caruncle	...	...	...	...	...	2
	Seeds having a caruncle	...	...	...	...	...	3
2	Leaflets rounded at apex	...	...	...	...	...	minima
	Leaflets acuminate at apex	...	...	...	...	...	viscosa
3	Calyx-lobes broad and almost hiding the corolla or pod	...	...	...	...	...	rufescens
	Calyx-lobes narrow	...	...	...	...	...	4
4	Peduncles with more than 2 flowers ; leaflets up to 5 in. across	...	...	...	...	...	aurea
	Peduncles 2-flowered ; leaflets up to 2.5 ins. across	...	...	...	...	...	5
5	Pods having partitions between the seeds	...	...	...	...	...	suaveolens
	Pods indented between the seeds but without partitions	...	...	...	...	...	cana

Pterocarpus Marsupium, Roxb. (p. 14)

This plant may be distinguished from all other leguminous plants found in this area by the following combination of characters :—(a) an erect tree, (b) pods orbicular, broadly winged, usually one-seeded, (c) leaves having more than 3 leaflets alternately arranged. Page 74, F.M.C.

Leguminosae—Mimosoideae

Mimosa rubicaulis, Lamk. (p. 15)

This plant differs from the two species of *Mimosa* mentioned on page 106, F.M.C., as follows :—

From *M. pudica* in being a large bush.

From *M. hamata* in having leaves up to 6 inches long with pinnae and leaflets correspondingly large (*M. hamata* has leaves less than 1 inch long).

Halorrhagidaceae

Myriophyllum indicum, Willd. (p. 16)

In the Key to the Families beginning on page 3, F.M.C., this plant leads to 9 (*Onagraceae*). The *Halorrhagidaceae* and the *Onagraceae* differ in that in the former each cell of the ovary has a separate style while in the latter there is only one style to the 1-6 cells.

Combretaceae**Anogeissus latifolia**, Wall. (p. 16)

In the key for the *Combretaceae* on page 113, F.M.C., this plant leads to *Terminalia*. *Anogeissus* differs from *Terminalia* in that the flowers are in globose heads and not in spikes or racemes.

Passifloraceae

Passiflora suberosa, L. (p. 17)

This plant may be distinguished from *P. foetida*, Linn. (page 125, F.M.C.) by its much smaller flowers and fruits, and by the absence of a glandular moss-like involucre of bracts.

Rubiaceae

Oldenlandia caerulea, Gamble (p. 17)

This plant traces down to 3 in the key on page 143, F.M.C., but it differs from the plants following, in that its flowers are sessile and solitary or in 3-flowered heads.

Randia uliginosa, DC. (p. 17)

This plant differs from the two species of *Randia* described on page 146, F.M.C., in being a tree and in having very much larger flowers and fruit.

Coffea Wightiana, W. & A. (p. 18)

Coffea differs from the genera of *Rubiaceae* mentioned on page 142, F.M.C., in having only one ovule in each cell of the ovary.

Compositae

Epaltes pygmaea, DC. (p. 19)

This plant differs from *E. divaricata* (page 154, F.M.C.) in being a much smaller plant with heads not exceeding .2 inch across, and in having black smooth slightly angled achenes and not pale ribbed glandular ones.

Gnaphalium indicum, Linn. (p. 19)

This plant differs from other species of *Compositae* (page 149, F.M.C.) found in this area in being a densely wooly plant only a few inches high.

Campanulaceae

Lobelia trigona, Roxb. (p. 20)

This plant differs from *Sphenoclea zeylanica*, the only plant of the family *Campanulaceae* included in F.M.C. (page 160), in having blue flowers on slender pedicels in leaf axils, and not yellowish-green flowers in spikes.

Ebenaceae

Diospyros Ebenum, Koenig. (p. 20)

This plant differs from the two species of *Diospyros* described on page 164 F.M.C. as follows :—

From *D. chloroxylon* in not being thorny and in not having the underside of the leaves covered with brown hairs.

From *D. tomentosa* in not having seeds with ruminant albumen, and in having cymes of male flowers which are not densely tawny-tomentose.

Asclepiadaceae

Secamone emetica, R. Br. (p. 21)

Tylophora asthmatica, W. & A. (p. 22)

Both these asclepiads will trace down to 9 in the key on page 174 F.M.C. The following supplementary key will help to distinguish between these two plants and those following 9 in the key :—

- | | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-----|--------------------------|
| 1 | Corona corolline | ... | ... | ... | ... | ... | ... | Gymnema sylvestre |
| | Corona staminal | ... | ... | ... | ... | ... | ... | 2 |
| 2 | Leaves lanceolate, small ; cymes short, rusty-pubescent | ... | ... | ... | ... | ... | ... | Secamone emetica |
| | Leaves broadly ovate | ... | ... | ... | ... | ... | ... | 3 |
| 3 | Follicles woody, blunt-tipped, up to 1 inch broad at base ; leaves up to 6 × 4 inches, glandular near the petiole | ... | ... | ... | ... | ... | ... | Marsdenia volubilis |
| | Not having these characters | ... | ... | ... | ... | ... | ... | 4 |
| 4 | Leaves less than 1 inch long ; cymes umbellate ; peduncles very short | ... | ... | ... | ... | ... | ... | Pentatropis micro-phylla |
| | Leaves more than 1 inch long, cymes branching or with long peduncles | ... | ... | ... | ... | ... | ... | 5 |
| 5 | Leaves cordate or obtuse at base, narrowed to apex ; cymes not rusty-villous | ... | ... | ... | ... | ... | ... | Tylophora asthmatica |
| | Leaves rounded or sub-acute at base, cuspidately acuminate at apex ; cymes rusty-villous. | ... | ... | ... | ... | ... | ... | Toxocarpus Kleinii |

Gentianaceae

Hoppea dichotoma, Willd. (p. 23)

This plant leads to 3 in the key to the *Gentianaceae* on page 182 F.M.C. It differs from *Enicostemma littorale* in having inconspicuous, slightly irregular flowers in shortly peduncled cymes and ovate leaves not exceeding .25 inch long; and from *Canscora sessiliflora* in having subentire stigmas and very short corolla lobes.

Boraginaceae

Trichodesma zeylanicum, R. Br. (p. 23)

This plant can be distinguished from the two species of *Trichodesma* described on page 185 F.M.C. by its much larger size, and by its calyx lobes which are rounded at the base and not lobed.

Scrophulariaceae

Limnophila racemosa, Benth. (p. 24)**Limnophila polystachya**, Benth. (p. 25)

The following key may be used to distinguish between these two species of *Limnophila* and the one described on page 208 F.M.C. :—

- | | | | | |
|---|---|-----|-----|--------------|
| 1 | Flowers in terminal or axillary, often branched, spikes ... | ... | ... | polystachya |
| | Flowers pedicelled ... | ... | ... | 2 |
| 2 | Stems up to 2 feet long ; corolla .5 in. long or more ... | ... | ... | racemosa |
| | Stems up to about 8 inches long ; corolla .3 in. long or less ... | ... | ... | gratioloides |

Ilysanthes hyssopioides, Benth. (p. 25)**Ilysanthes serrata**, Urban. (p. 25)

In place of the key on pages 209 and 210 F.M.C., the following may be used for distinguishing the species of *Ilysanthes* :—

- | | | |
|---|---|----------------|
| 1 | Leaves with 1-5 ribs from the base ; capsules ovoid or subglobose ... | 2 |
| | Leaves penninerved ; capsules linear ... | 4 |
| 2 | Plant under 3 inches high ; leaves ovate, under .25 in. long ; | |
| | corolla blue ... | minima |
| | Plant 4-6 inches high ... | 3 |
| 3 | Corolla .25 inch long or less, white or cream-coloured ... | parviflora |
| | Corolla about .5 inch long, blue ; leaves linear or narrowly oblong ... | hyssopioides |
| 4 | Leaves deeply and closely serrate, the teeth spine-pointed ... | serrata |
| | Leaves shallowly and obtusely serrate ... | 5 |
| 5 | Stems prostrate below and rooting at the nodes ; leaves up to .4 inch | |
| | broad ... | veronicaefolia |
| | Stems erect from the base ; leaves up to 1 inch long by .15 inch broad. | oppositifolia |

***Striga orobanchioides*, Benth. (p. 26)**

This plant differs from the species of *Striga* described on page 207 F.M.C. in having a 4-ribbed calyx, a pinkish corolla and red fleshy leaves and stem.

***Centranthera humifusa*, Wall. (p. 27)**

This plant traces down to *Moniera* in the key to the genera of *Scrophulariaceae* on page 205 F.M.C. The genus *Centranthera* may be distinguished from *Moniera* by the spathaceous calyx split down the front, plants of the latter genus having 5-partite calyces with unequal lobes.

Lentibulariaceae***Utricularia caerulea*, Linn. (p. 28)*****Utricularia caerulea*, Linn. var. *filicaulis* C. B. C. (p. 28)*****Utricularia Wallichiana*, Wt. (p. 28)*****Utricularia stricticaulis*, Stapf (p. 29)**

The following key may be used to distinguish between these four plants and the one described on page 211 F.M.C. :—

- | | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-----|---------------------------------------|
| 1 | A floating water-plant | ... | ... | ... | ... | ... | ... | <i>flexuosa</i> |
| | Marsh plants with erect stems rooted in the ground | ... | ... | ... | ... | ... | ... | 2 |
| 2 | Scales and bracts of the scape attached by their middles ; capsules | ... | ... | ... | ... | ... | ... | 3 |
| | globose | | | | | | | |
| | Scales and bracts of scape attached by their bases ; capsules flattened | ... | ... | ... | ... | ... | ... | 4 |
| 3 | Corolla purple | ... | ... | ... | ... | ... | ... | <i>caerulea</i> |
| | Corolla white ; a very minute plant | ... | ... | ... | ... | ... | ... | <i>caerulea</i> var <i>filicaulis</i> |
| 4 | Scape very slender, twining ; corolla yellow | ... | ... | ... | ... | ... | ... | <i>Wallichiana</i> |
| | Scape relatively stout, not twining ; corolla purple | ... | ... | ... | ... | ... | ... | <i>stricticaulis</i> |

Bignoniaceae***Dolichandrone falcata*, Seem. (p. 30)**

This plant may be distinguished from *Millingtonia hortensis* by its stamens which have both anther cells perfect, and by its much shorter corolla tube. It is distinguished from the other species of *Bignoniaceae* described on page 212 F.M.C. by its white corolla and its curved pod-like capsule.

Acanthaceae***Cardanthera balsamica*, C.B.C. (p. 31)**

The genus *Cardanthera* differs from the genera of *Acanthaceae* in the key on pages 214 and 215 F.M.C. in that the seeds are attached to small supports which are not hooked.

Stenosiphonium Russellianum, Nees var **subsericeum** T. And. (p. 32)

This variety is characterized by smaller leaves with white silky undersurface.

Andrographis elongata, T. And. (p. 32)

This plant differs from the two species of *Andrographis* described on page 220 F.M.C. in its straggling habit, and in its leaves which are broad, rounded at the base and then decurrent.

Barleria longiflora, Linn. (p. 32)

This plant can be distinguished from the species of *Barleria* described on page 220 F.M.C. and from others occurring in S. India by its white corolla with extremely long tube, its large characteristic outer calyx lobes and its small velvety leaves.

Verbenaceae

Vitex altissima, R. Br. (p. 33)

This plant can be readily distinguished from the two species of *Vitex* described on page 228, F.M.C., which have leaflets which are thin and white-tomentose on the undersurface; in this plant the leaflets are thick and rather leathery in texture and the undersurface is not white; in the variety *Alata*, the broad wing along the petiole is very characteristic.

Labiatae

Anisochilus eriocephalus, Benth. (p. 34)

This plant traces down to 6 in the key for the genera of *Labiatae* on pages 231 and 232 F.M.C. The genus *Anisochilus* differs from *Anisomeles* and *Leucas* in that the flowers are in dense usually long-peduncled spikes and not in axillary whorls.

Leucas biflora, R. Br. (p. 34)

This plant differs from the three species of *Leucas* described on page 236 F.M.C. in having the mouth of the calyx straight, and from these and from *L. hirta* in having only two flowers at a node.

Loranthaceae

Loranthus longiflorus, Desv. (p. 35)

This plant is very characteristic, being the only plant found in this area which is attached parasitically to the branches of trees and is itself a shrubby plant with large leaves. In the key at the beginning of F.M.C. this genus is found on page 14 under *Apetalae* but it would probably be looked for under *Sympetalae* as it appears to have distinct sepals and petals and the latter are united.

Moraceae

Ficus tomentosa, Roxb. (p. 35)

This plant is distinguished from the other species of *Ficus* described on pages 272 and 273, F.M.C., by its buff-coloured or pale-brown densely tomentose receptacles, and by the glossy glandular patch at the base of the midrib on the underside of the otherwise tomentose leaf.

MONOCOTYLEDONS

Taccaceae

Tacca pinnatifida, Forst. (p. 36)

In the key to the genera of the Monocotyledons on page 17, F.M.C., this plant traces down to 12, *Amaryllidaceae*. It differs from all species of *Amaryllidaceae* found in this area in having very large compound leaves. The leaf is very similar to that of *Amorphophallus sylvaticus* but can be distinguished from it by its hollow petiole and non-succulent texture.

Dioscoreaceae

Dioscorea oppositifolia, Linn, var. *Linnaei*, P. & B. (p. 37)

This plant and the species of *Dioscorea* described on page 286, F.M.C., can be distinguished as follows :—

Stems twining to the left ; leaflets 3 to 5	...	...	...	...	pentaphylla
Stems twining to the right ; leaves simple	...	...	...	...	oppositifolia

Commelinaceae

Cyanotis tuberosa, Schult, f. (p. 38)*Cyanotis papilionacea*, Schult, f. (p. 39)

These species may be distinguished from those described on pages 291 and 292, F.M.C., by the following key :—

1	Cymes enclosed in the leaf sheaths	...	...	...	...	axillaris
	Cymes not enclosed in the leaf sheaths	...	...	...	...	2
2	Valves of capsule separating from a free central axis on dehiscence	...	...	...	...	papilionacea
	Capsule without a central axis after dehiscence	...	...	...	...	3
3	Stems and leaves cottony or silky-cobwebby	...	...	...	...	fasciculata
	Stems and leaves not cottony or silky-cobwebby	...	...	...	...	4
4	Bracts much longer than the cymes ; leaves narrowly elliptic, glabrous on both surfaces ; roots fibrous	...	...	...	...	cristata
	Bracts shorter than the cymes ; leaves linear, covered with long hairs below ; roots tuberous	...	...	...	...	tuberosa

Commelina undulata, R. Br., var. *setosa*, C.B.C. (p. 39)

The following key for the species of *Commelina* may be used in place of that found on pages 292 and 293 F.M.C.—

- | | | | | | | |
|---|--|-----|-----|--------------|-----|---------------------|
| 1 | All 3 cells of capsule one-seeded | ... | ... | ... | ... | undulata var setosa |
| | Two cells of capsule 2-seeded | ... | ... | ... | 2 | |
| 2 | Capsule 2-celled ; spathes lanceolate, lobed at the base | ... | ... | attenuata | | |
| | Capsules 3-celled | ... | ... | 3 | | |
| 3 | Spathes funnel-shaped ; leaves ovate or sub-orbicular | ... | ... | benghalensis | | |
| | Spathes folded along the mid-rib, margins not joined at base ; | 4 | | | | |
| | leaves narrow. | | | | | |
| 4 | Spathes sessile ; seeds grooved | ... | ... | subulata | | |
| | Spathes peduncled ; seeds not grooved | ... | ... | nudiflora | | |

Many of the plants of this genus are very variable and their identification is not easy. It is necessary to examine a number of capsules and find the maximum number of cells and seeds, as in some specimens, owing to incomplete fertilization, less than the characteristic number may develop. Several other species of *Commelina* are reported from eastern parts of the Presidency and it is possible that further search may show that they occur near Madras City.

Palmaceae

Phoenix farinifera, Roxb. (p. 40)

This plant can be distinguished from the species of *Phoenix* described on page 295, F.M.C., as follows :—

- | | | | |
|---|----|----|--------------------------|
| Leaflets with a conspicuous yellow or orange pulvinus at the attachment to the rachis, lowest leaflets reduced to flat spines | .. | .. | farinifera |
| Leaflets not or only slightly pulvinate, lowest leaflets reduced to channelled spines | .. | .. | humilis var. pedunculata |

Araceae

Theriophonum minutum, Engl. (p. 41)

Theriophonum Wightii, Schott (p. 42)

In the key to the genera of *Araceae* on page 298, F.M.C., these plants trace down to *Colocasia*. The South Indian species of *Theriophonum* differ from *Colocasia* in being much smaller plants and in not having peltate leaves. *Theriophonum* differs from *Typhonium*, to which it is nearly allied, in having numerous ovules in the ovary. The two species of *Theriophonum*, if they are distinct, can be distinguished by their leaves as follows :—

- | | | | |
|---|-----|-----|---------|
| Lobes of leaves linear or very narrow | ... | ... | Wightii |
| Lobes of leaves broadly triangular or rounded | ... | ... | minutum |

Amorphophallus sylvaticus, Kunth (p. 43)

This plant can be distinguished from the species described on page 299, F.M.C., as follows :—

- | | | | |
|--|-----|-----|--------------|
| Peduncle long and slender ; spathes about 1 inch wide | ... | ... | sylvaticus |
| Peduncle short and very stout ; spathes up to 10 inches wide | ... | ... | campanulatus |

DESCRIPTIONS OF FAMILIES, GENERA AND SPECIES

Portulaca Wightiana, Wall.

A small, semi-prostrate, succulent, probably perennial herb. Stems much branched; thick, up to about 3 inches long, sending down slender red, wiry roots from several nodes; nodes close together, with a ring of persisting lanceolate, acuminate, white scales at each; sections of stems between nodes like inverted truncated cones; lower part of stem cylindrical, red, scaleless. Leaves lanceolate or ovate-lanceolate, sessile, acute, up to .3 inch long, opposite, very thick and turgid, upper surface strongly convex, under surface flat or concave, green with whitish markings. Flowers solitary, terminal, sessile, surrounded by four leaves and almost hidden by a ring of numerous narrow white scales, inconspicuous till fully open, .25 inch across when open. Sepals 2, ovate, blunt-tipped, greenish-yellow. Corolla yellow; petals 4, 2 opposite the sepals and 2 between them, all broadly ovate, the former usually notched at apex. Stamens 5 to 8; anthers orange-yellow; pollen grains spherical .05 mm. across, surface smooth and apparently sticky. Ovary spherical, glossy, pale green; style shorter than the filaments; stigma orange-yellow, divided into 4 to 6 elongated diverging lobes, closely studded with elongated gland-like bodies. Capsule one-celled, top half falling off on ripening. Seeds numerous, kidney-shaped, about $.4 \times .5$ mm., reddish-brown, surface covered with small rounded bosses in longitudinal lines.

Growing gregariously in bare sandy patches in scrub-jungle at Tambaram (College Compound). The soil in this area is alkaline and marshy during part of the year. Under dry conditions, only the scale-covered stems are seen, the leaves being shrunk, yellowish or tinged with red and smaller than the scales. Plants found in this condition in February and March, on being watered produced green leaves, flowers and ripe capsules in a few days. A number of plants were found in flower in March and April. The flowers open only for a short time during the hottest part of the day, about 1-30 to 2-30 p.m. The tips of the leaves appear to be attached by a joint and it is possible that what appear to be leaves are actually leaf petioles functioning as leaves.

Grewia rotundifolia, Juss.

A large shrub or small tree branching from near the base. Bark smooth, ashy, with fine longitudinal corky cracks and transverse depressions about an inch apart. Leaves alternate, in two rows, broadly ovate or sub-orbicular, up to about 2.5×2 inches, base subcordate, upper side usually more deeply lobed than the other, apex rounded or with a very obscure tip, margin obscurely and irregularly serrate, both surfaces velvety, undersurface grey especially in old leaves, 5 prominent and one obscure nerve from the base; petiole up

to about .2 inch ; stipules oblong, slightly auricled on one side at base, .25 inch long, soon falling. Flowers in umbel-like, 3-flowered cymes in leaf-axils ; peduncles up to about 1 inch long, 1, 2 or 3 at each axil, slender, with minute tufts of hairs ; pedicels up to about .4 inch ; bracteoles very small, di- or trifid. Sepals oblong, .4 inch long, acute, light yellow, pubescent. Petals with a broad, densely hairy thickened greenish base and small yellow limb. Stamens with bright yellow filaments and bright yellow rounded anthers. Ovary densely hairy ; style about twice as long as the filaments ; stigma of two greenish lobes with fringed margins. Drupes slightly 2-lobed, greyish, softly hairy.

A common plant in scrub jungle. Tambaram (College Compound). The leaves fall in April and the branches become covered with tufts of bright yellow flowers, the plant then presenting a striking appearance. The fruit ripens a few months later.

***Crotalaria biflora*, Linn.**

A small annual herb. Stem up to about 5 inches long, trailing on the ground, villous. Leaves simple, ovate, rounded at the base, rounded or bluntly pointed at the apex, most not exceeding .5 inch long, bluish-green, both surfaces clothed with scattered long white hairs ; petioles very short ; stipules absent. Flowers in 1- or 2-flowered leaf-opposed racemes. Peduncles up to about .8 inch long. Bracts and bracteoles filiform. Calyx lobes green, bearing long white hairs, 3 narrowly lanceolate, 2 broadly lanceolate and joined for about half their length. Corolla yellow, about .35 inch long ; standard with fine brown radiating lines. Pod sub-globose, .4 × .35 inch, slightly flattened and with an obscure groove on each side, thinly covered with longish white hairs. Seeds about 20 to each capsule, kidney-shaped, about .15 inch long.

Growing in open ground at Tambaram (College Compound), not frequent. Flowers in January and sets seed in February.

***Sesbania procumbens*, W. & A.**

An annual herb. Stems several, up to about 3 feet long, straight, radiating from the root and resting on the ground, not rooting at the nodes, elliptical in cross-section, somewhat ridged, bearing scattered obtuse prickles. Leaves alternate, abruptly pinnate, up to about 3.5 inches long, with up to about 30 pairs of leaflets ; bracts ovate, acute, scarious, with a green rib ; leaflets oblong, 0.25 inch × 0.06 inch, bases unequal, upper surface glaucous, margins brownish-red ; rachis white along the middle. Flowers solitary or in pairs on very short pedicels in leaf axils, 0.25 inch long. Calyx with short triangular teeth. Corolla yellow ; standard without appendages and with dark purple spots on the back. Pods straight, elliptical in cross-section, constricted externally and with a partition between the seeds, acute at apex, up to about 4 inches long, containing up to about 25 seeds. Seeds shortly cylindrical 0.1 inch long, pale greenish-brown, without strophiole but with a prominent micropyle.

Tambaram (College Compound) in open ground, not common. Flowers and sets seeds at most parts of the year.

Atylosia, W. & A.

Herbs or shrubs, erect or twining. Leaves pinnately or rarely digitately 3-foliate; leaflets with resinous glands beneath; stipules lanceolate or setaceous; stipels small or o. Flowers usually yellow, axillary, in pairs or racemes; bracts usually broad, membranous, deciduous; bracteoles o. Calyx-tube campanulate, the lobes distinct, the lowest the longest, the two upper joined together in an entire or bifid lip. Corolla more or less exserted, sometimes remaining attached after withering; standard orbicular, auricled at base; wings obliquely obovate or oblong; keel slightly curved, obtuse. Stamens in two groups; anthers uniform. Ovary sessile, ovules 3 or more; style filiform, incurved, glabrous; stigma capitate. Pod linear or oblong, septate within, the valves more or less transversely or obliquely depressed between the seeds. Seeds ovate or orbicular, with a conspicuous strophiole.

Atylosia scarabaeoides, Benth.

An annual herb with a deep tap root, climbing by twining to the right, or trailing over the ground, sometimes erect at first. Stems wiry, round, red or greenish-red, pubescent, much branched from near the base. Leaves with three leaflets, all 3-nerved from the base and with a network of veins prominent below, margins raised on the underside, both surfaces grey-green, tomentose but not glandular; end leaflet longest, ovate or obovate, tip rounded or slightly retuse, up to .8 inch long, petiolule about .15 inch; side leaflets ovate, lower half slightly larger than the upper half, apex slightly retuse, with a short petiolule and a hairy pulvinus. Flowers one or two, on very short peduncles in leaf axils. Calyx with 4 lanceolate hairy lobes. Standard yellow with red veins on the back; wings yellow; keel greenish-yellow. Stamens 9 and 1. Ovary with long silky hairs; style glabrous; stigma small, terminal. Pod .8 to .9 inch long and .25 inch broad, with straight depressions outside and septa within between the seeds, usually with 5 seeds, sometimes 4 or 3, dark-brown, with long yellowish silky hairs. Seeds with a grooved caruncle.

A very common plant at Tambaram in scrub jungle and grassy places. Flowers during the greater part of the year except the hottest months. Not previously recorded from the Carnatic.

Rhynchosia rufescens, DC.

Plate. I-A

A large herbaceous plant with wiry branches up to 8 feet long. Stems straggling over large bushes and twining at their upper ends, round, red where exposed to the sun, green below, finely glandular-pubescent. Leaves with 3 almost equal leaflets pinnately arranged,

about 3.5 inches long including petiole ; leaflets ovate, about 1.5 inch \times 1 inch, side ones unequal-sided, finely glandular-pubescent, prominently net-veined below, margins entire, tips blunt or sub-acute, smelling of geranium when crushed. Flowers in slender racemes in the axils of leaves ; pedicels about .1 inch ; racemes about 5- to 7-flowered, flowers of a raceme opening at long intervals so that the lowest have ripened and scattered the seeds while the upper are still in small bud. Calyx almost concealing the flower ; lobes ovate, upper two joined for about $\frac{1}{3}$ to $\frac{1}{2}$ of their length, not enlarging on fruiting, truncate or slightly cordate at the base, tips bluntly mucronate, margins and veins reddish, glandular-pubescent. Standard broad, .3 \times .25 inch, bright yellow with a red patch near the middle, streaked with red on the back ; keel greenish-yellow. Pod .4 inch long, ovoid, flattened, shortly beaked and with an open slit below the beak, dull chocolate-brown, pubescent, one-seeded, the two valves curled inwards after dehiscing. Seed dark olive-green to black, glossy, with a blackish caruncle.

On Unamalai and Vandalur Hills. Flowers and sets seeds in January.

Rhynchosia suaveolens, DC.

Plate. I-B

A sticky unpleasant-smelling undershrub, erect till about 2 feet high and then climbing by twining. Stems round, pale green, up to 1 inch across ; branches wiry. Leaves having 3 leaflets pinnately arranged, up to 6 inches long including the petiole, covered with fine sticky glandular hairs ; leaflets ovate, shortly acuminate, up to about 2.5 \times 2 inches, light green, 2 side ones with lower sides about twice as large as the upper sides. Peduncles axillary, slender, 1- or 2-flowered. Bracts and bracteoles small, narrowly lanceolate, soon falling. Flowers .4 inch long. Calyx lobes lanceolate, not accrescent, 2 upper joined for more than $\frac{1}{2}$ their length. Standard yellow, with 2 small white auricles near the base ; wings yellow, spurred near the base ; keel greenish. Stamens 9 and 1. Pods 2-seeded, about .75 inch \times .4 inch, flattened, bluntly beaked, compressed between the seeds and with a slightly oblique septum dividing the pod into two cells, light brown, pubescent. Seeds dull black, smooth, with a light brownish caruncle.

Tambaram (College Compound), Vandalur. Flowers and sets seed in January.

Rhynchosia cana, DC.

An erect non-aromatic undershrub with few branches. Main stem about .25 inch across, dark red, with longitudinal cracks ; branches round, somewhat ridged, red on one side and green on the other, pubescent, not twining at their ends. Leaves with three leaflets, up to about 2.5 \times 2 inches, net veined, pubescent on both surfaces, hairs of young leaves glandular but not sticky ; mid-leaflet broadly ovate, blunt tipped ; side leaflets

irregularly ovate, the lower half much broader than the upper ; rachis channelled, with two small red gland-like stipels at the attachment of the mid-leaflet and one at the attachment of each of the side leaflets. Peduncles short, 2-flowered, in the axils of leaves. Calyx lobes lanceolate, lowest slightly longest, two upper joined for $\frac{2}{3}$ of their length, hairy, green and dark red. Standard broad, bright yellow with a small brownish-red patch near centre and red veining on the back ; wings narrow, yellow ; keel very pale green, upper $\frac{1}{2}$ joined. Stamens 9 and 1. Pod 2-seeded, about .5 inch long, inflated, slightly constricted between the seeds, somewhat obliquely truncate at the end and with a small slit at the end when ripe, green mottled red, becoming light brown, glabrous. Seed glabrous, dull brown speckled lighter and darker, with a black caruncle.

A common plant in scrub jungle at Tambaram (College Compound). Flowers and sets seeds January and February.

Pterocarpus, Linn.

Trees. Leaves alternate, imparipinnate ; leaflets alternate, usually leathery ; stipules small, deciduous ; stipels 0. Flowers yellowish, in terminal or axillary racemes or panicles ; bracts small, deciduous ; bracteoles 2, soon falling. Calyx tube campanulate, somewhat curved ; teeth short, the 2 upper often partly joined. Corolla exserted, the petals all long-clawed ; standard orbicular, crisped at the margin ; wings oblique, the margins also crisped ; keel-petals oblique, smaller, slightly connected. Stamens 10, the filaments joined in a tube split above, sometimes split in 2 bundles of 5, sometimes the one opposite the standard free ; anthers uniform. Ovary sessile or stalked ; ovules 2 to 6 ; style filiform, incurved, beardless ; stigma capitate. Pod orbicular, compressed, with a broad wing, the style turned down towards the stipe. Seeds 1, rarely 2, oblong or more or less kidney-shaped ; hilum small.

Pterocarpus Marsupium, Roxb. The Gum-kino Tree.

Plate I-C

A medium-sized tree as found in this district. Bark brownish grey to dark grey, with vertical cracks. Leaves compound with 3 to 5 leaflets ; leaflets irregularly distributed along a round rachis and resembling simple leaves on a branchlet, broadly oblong-ovate, up to about 4×1.6 inches, base rounded or bluntly wedge-shaped, apex truncate and emarginate or bilobed, margin entire, leathery, with numerous straight veins pinnately arranged along a central rib ; petiolule thickened, curved, .25 inch long. Flowers in simple racemes in leaf axils and in terminal panicles, yellow. Pod orbicular, with a broad wavy wing all round, up to about 1.75 inches across, style persisting as a point about $\frac{1}{8}$ of the circumference from the stipe, stipe about .2 inch long, margin convex between style and stipe. Seeds 1 or 2, embedded in a hard fibrous core, flattened, about .4 inch long.

Common between the Vandalur and Vengambakkam Hills. The pods are found on the trees for most of the year. Flowers not seen.

***Mimosa rubicaulis*, Lamk.**

A large very prickly straggling shrub. Branchlets red, roughly 5-sided, with 5 rows of curved thorns. Thorns about .12 inch long. Leaves bipinnate, about 6-inches long; pinnae 5 pairs or fewer; leaflets up to 11 pairs per pinna; rachis armed with thorns. Leaflets glabrous, oblong, up to about $.6 \times .35$ inch, attached to the very short petiolule at a corner, with the main nerve running parallel to and about $\frac{1}{4}$ of the width of the leaflet from the upper edge. Stipules filiform, pointed and stiff but not modified to thorns. Flowers sessile, in globose heads, a few scattered on the peduncle, sweet-scented. Peduncles about 1 inch long, solitary in the axils of the leaves. Petals 4, ovate, red on inner surface, joined to form a white tube below. Stamens about 8; filaments .35 inch long, deep pink; anthers very small. Pods curved, thin, with a line of thorns on the inner suture only, containing up to 9 seeds but usually fewer, red, dilated round each seed, tip blunt or shortly acute, very shortly stalked. On ripening the pod breaks into more or less square pieces each containing one seed, the marginal sutures remaining attached to the plant. Seeds circular, flattened, .2 inch across, pale brown, with a horseshoe-shaped line on each face.

At the foot of the hills at Vandalur and Vengambakkam, forming dense thickets. Flowers and fruits from December to February.

Halorrhagidaceae

Herbs, often aquatic. Leaves opposite or whorled, sometimes partly alternate, when submerged often reduced to threads; stipules 0. Flowers hermaphrodite or unisexual, small, axillary, solitary or fascicled, sessile or pedicelled. Calyx-tube joined to the ovary, lobes usually 4. Petals 4, sometimes 2 or 0, valvate or slightly imbricate. Stamens 8, 4 or 1; anthers 2-celled, dehiscing longitudinally and laterally. Ovary 4-, 2- or 1-celled; ovules 4, pendulous; styles as many as cells; stigmas papillose or plumose. Fruit small, dry or drupaceous, 4-, 2- or 1-celled, indehiscent or separating into carpels. Seeds pendulous, 4 or rarely 1.

***Myriophyllum*, Linn.**

Glabrous aquatic herbs with floating stems. Leaves opposite or whorled, the floating ones usually linear-serrate, the submerged ones modified to branched threads. Flowers very small, hermaphrodite or male and female separate but on the same plant, axillary or in nearly naked spikes; male very shortly pedicelled or sessile, female sessile. Calyx in

male minute, 4 rarely 2-lobed, sometimes 0 ; in female adnate to the ovary, 4-furrowed, lobes 0 or 4, minute. Petals in male 2 or 4, concave, sessile ; in female usually 0. Stamens 2, 4 or 8. Ovary of 4, rarely 2, carpels ; ovules solitary, pendulous ; styles short, plumose. Fruit 4-furrowed, separating into 4 or 2 cocci ; embryo straight or curved.

***Myriophyllum indicum*, Willd.**

An annual water-plant with floating stems. Stems slender, round, glabrous, several feet long, the lower end rooted in the mud, the upper end floating on the surface of the water, freely branching at the upper end. Leaves whorled, whorls numerous ; submerged leaves consisting of pinnately branched filaments, the branching alternate, the branches curved ; floating leaves green, lanceolate, very narrow at the base, '5 inch long or shorter, margins with a few slender serrations, in passing down the stem the leaves become narrower and the serrations more numerous and longer. Flowers hermaphrodite, 4 or 5 at a node in leaf-axils, sessile. Calyx lobes 4, minute, triangular, green. Corolla lobes 4, about '07 inch long, ovate, pink, soon falling. Stamens 8 ; anthers large, oblong. Ovary inferior, 4-lobed, tubercled, 4-carpelled, with one ovule in each carpel ; styles 4, short, spreading. Fruit separating into 4 one-seeded parts.

Very plentiful in a tank in the Vengambakkam Hills. Flowers in February.

***Anogeissus*, Wall.**

Trees or shrubs. Leaves alternate or subopposite, petioled, entire. Flowers in dense globose heads on short axillary peduncles or in short cymes ; bracts on the peduncles or at the cyme branches, often leafy ; bracteoles minute. Calyx-tube slender above the ovary ; limb cup-shaped with 5 lobes. Petals 0. Stamens 10, in 2 series ; anthers small. Ovary inferior, 1-celled ; ovules 2, pendulous ; style subulate. Fruits packed in dense heads, compressed, 2-winged, ending in the persistent calyx-tube and sometimes limb. Seed 1 ; cotyledons rolled up.

***Anogeissus latifolia*, Wall.**

Plate II-A

A medium-sized tree. Bark thin, smooth, light brownish-grey with irregular lighter patches caused by exfoliation. Branchlets grey, with a thin stringy skin often frayed. Leaves sub-opposite or opposite, broadly ovate, straight at base, blunt or flattened at the apex, the two sides often partly folded together, leathery, glabrous on both surfaces, up to about 4 inches long and 2'6 inches broad, becoming red, or yellow with red patches, before falling ; midrib yellow, with numerous curved, not very conspicuous, nerves and a network of finer veins ; petiole bright red, about '4 inch long. Flowers in small heads on

short peduncles in leaf axils and in cymes at the ends of branches. Fruits closely packed in heads, somewhat flattened, 2-winged with a straight beak, first yellow, then brown, about .15 inch across, up to about 16 to a head.

Vengambakkam Hills. Flowers about December. Fruits February and March.

***Passiflora suberosa*, L. (*P. minima* L.).**

A climber with stems up to about 6 feet long. Lower parts of stems with a whitish corky covering with wide longitudinal yellowish-brown fissures; upper stems slender, glabrous. Tendrils closely coiled, axillary. Leaves shallowly palmately 3-lobed, middle lobe largest, tips of all lobes abruptly acute, up to 4 inches long by 3.25 inches broad; petiole up to about .5 inch, with two round purplish glands near its attachment to the blade; stipules filiform, curved, purplish. Flowers about .75 inch across, 1 or 2 in leaf axils, or in pairs not at axils but often at the ends of branches. Peduncles and pedicels slender. Bracteoles very small, filiform, soon falling. Calyx lobes narrow, greenish. Petals absent. Corona of 3 rings; outer of narrow spreading greenish teeth purplish at the base; middle of short knobbed filaments; inner of flattened processes joined to each other (these processes are crested with a mat of short hairs that hold the pollen shed from above and so aid in its distribution). Fruit blue-black, ovoid, glabrous, about .6 inch long. Seeds pear-shaped, surface pitted.

A plant originating in South America and found running wild in Madras gardens. The fruits are much sought after by birds, who doubtless are responsible for the plant's distribution.

***Oldenlandia caerulea*, Gamble**

An annual, erect or semi-prostrate herb. Stems very slender, wiry, red, with short stiff hairs. Leaves linear, sessile, up to about .6 inch long, apex bristle-pointed, upper surface glossy but scabrid, margins turned back, undersurface pale and usually with two parallel veins standing out; stipules scarious, truncate and with 4 to 6 long bristles and some much shorter ones. Flowers sessile, solitary in axils and in terminal 2- or 3-flowered heads, about .1 inch long. Calyx lobes 4, acutely triangular, bristle-pointed. Corolla pale blue. Capsule globose, scarbid.

In open ground at Tambaram (College Compound), not frequent. Flowers in January and sets seed in February.

***Randia uliginosa*, DC.**

A small tree. Branches curved and with numerous short branchlets which usually bear groups of 3 or 4 short stout spines at their ends. Bark of trunk brownish-grey, with large warty outgrowths; bark of branchlets brown, coming off in thin flakes. Leaves mostly in groups of 4 or 5 near the ends of the branchlets, some arranged oppositely,

oblanceolate to ovate, base narrowed, apex rounded, almost sessile, glabrous on both surfaces, glossy above, with about 6 pairs of pinnately arranged nerves, up to about 6×3 inches, usually smaller. Flowers solitary at the ends of branchlets, 1.5 inches across, white, scented. Corolla-lobes 5, 6 or 7, spreading. Filaments very short; anthers linear. Fruit a fleshy berry up to about 1.8×1.5 inches, end hollow, yellow when ripe, 2-celled. Seeds numerous, embedded in sweet-smelling pulp, ovoid, flattened, .15 inch long, brown, glossy.

In the higher parts of the bed of a tank between Vandalur and Nedunkundram. Flowers in July. Ripe fruit found in July and March. In this tank-bed there is a large patch of this plant growing as a low, almost procumbent shrub which flowers at the same time as the tree but does not appear to produce fruit.

Coffea, Linn.

Shrubs. Leaves opposite or ternate; stipules broad, interpetiolar. Flowers in axillary fascicles or cymes or solitary: bracteoles joined into a single or double calyx-like ring, often glandular. Calyx tube short; teeth 4 or 5, short, or numerous and irregular, often glandular within. Corolla-tube short or long; lobes 4 or 5, spreading, twisted in the bud. Stamens 4 or 5; filaments short or 0; anthers linear, attached to the throat of the corolla-tube. Ovary 2-celled; ovules one in each cell, peltate on the septum; style slender, bifid at apex; the lobes linear. Fruit a small drupe with 2 plano-convex cartilaginous or bony pyrenes. Seeds concave or grooved on the inner side, the testa membranous.

Coffea Wightiana, W. & A.

A shrub up to about 8 feet high but usually much smaller. Main stem upright, slender, branches mostly at right-angles to main stem, branchlets at about 45° to branches. Stiff pointed stipules at the ends of branchlets make the plant semi-thorny. Bark smooth, very pale yellowish-grey, with fine longitudinal cracks. Leaves opposite, lanceolate to ovate, almost sessile, blunt to sub-acute at apex, acute or acuminate at base, glabrous except at the base where they are pubescent, not usually exceeding 1 inch in length, turning yellow before falling. Interpetiolar stipules shallowly triangular, apex long, stiff and curved outwards, margins with stiff hairs. Flowers solitary at the ends of branchlets. Calyx tube very short, green, with 5 teeth each consisting of 3 red gland-like processes. Corolla white, jasmine-scented, up to 1.1 inch across; tube up to .75 inch long; lobes spreading, twisted to the right in the bud, the tips not meeting. Stamens 5, in the corolla tube. Style long, cleft at the end. Fruit a small drupe containing two woody pyrenes.

Common at Vandalur and Tambaram (College compound) in scrub jungle. This plant appears to flower more than once a year, but remains in flower only a day or so. It is almost leafless when in flower but is then covered with white flowers and is a striking and

beautiful plant ; at other times it is very inconspicuous. As with cultivated coffee, all plants appear to flower together. Seen in flower during the third week of March and again during the third week of June the same year.

***Epaltes pygmaea*, DC.**

Plate II-B

A small branching prostrate or semi-prostrate herb. Stems green, with three shallowly and irregularly toothed wings. Leaves sessile, narrowly oblong-spatulate, rather thick, glabrous, up to about .75 inch long, often not more than .25 inch. Margins crenate, midrib obscure, nerves invisible. Flower-heads single in leaf axils, .15 inch across or less, spherical in bud, thistle-shaped when in flower, broader than long when in seed ; peduncle slender, about .25 inch long. Bracts of involucre in several series, acute, glabrous, centre green, margins scaly and colourless or red. Female flowers in several series on the outside, opening before the bisexual flowers ; calyx tube very slender, with 2 or 3 narrow teeth ; style bifid, just emerging from the calyx tube. Bisexual flowers occupying the whole of the centre of the inflorescence ; corolla tube funnel-shaped, 4- or 5-lobed, pink ; style extending far above the mouth of the corolla tube, stigma studded with clear, colourless, elongated, apparently sticky processes ; anthers joined and forming a mauve tube round the base of the style. Pollen grains white, spherical, echinate. Achenes black, glossy not ridged, .4 to .5 m.m. long.

Common on grassy maidans near Tambaram. Also found at San Thome. Flowers and sets seed in January and February.

***Gnaphalium*, Linn.**

Hoary or woolly herbs. Leaves alternate, entire. Heads heterogamous, small, not rayed, in terminal or axillary corymbs or fascicles ; outer flowers female, fertile, very many, in 2 to many rows, corollas filiform 3- or 4-toothed, style-arms slender truncate or capitate ; inner flowers hermaphrodite, fertile, few, corollas tubular, shortly 5-lobed, anther-bases with slender tails. Bracts of involucre many, imbricate, all more or less scarious. Receptacles naked or pitted. Achenes small, oblong or obovoid, often minutely scaly ; pappus hairs in one series, more or less joined at the base, soon falling.

***Gnaphalium indicum*, Linn.**

A small erect annual herb about 4 inches high, usually branched from the base. Stems densely covered with white wool. Leaves alternate, linear-spatulate, up to about 1 inch long, greyish-green, woolly. Flowers in terminal spikes about 1 inch long. Heads about .125 inch long, thistle-shaped, yellowish, woolly. Bracts of involucre strap-shaped, scarious,

yellow with a green centre. Receptacle green. Flowers not rayed, mostly female, a few in the centre male and female. Hairs of the pappus in one series. Achenes light brown, covered with white scales, about .3 m.m. long.

Common on the drying beds of tanks near Vandalur and Tambaram, at the foot of the hills. Flowers in January and February. The drying plant has a pleasant aroma.

Lobelia, Linn.

Small herbs or tall undershrubs. Leaves alternate, usually toothed. Flowers on axillary 1-flowered peduncles; bracts leafy; bracteoles small or 0. Calyx superior, 5-toothed. Corolla oblique, 2-lipped, the upper 2-partite, the lower 3-lobed. Staminal-tube free or nearly so; anthers joined, 2 or all tufted at apex. Ovary 2-celled; stigma shortly bifid. Fruit a loculicidally 2-valved capsule. Seeds very many, minute, ellipsoidal, compressed or trigonous.

Lobelia trigona, Roxb.

A small marsh herb up to 1 foot high but usually only a few inches high in this district. Stems succulent, 3-sided and narrowly 3-winged. Leaves alternate, cordate or roundly deltoid, base flat and then narrowed, almost sessile, with 2 pairs of nerves from near the base, glabrous on both surfaces, up to about .5 inch long and broad. Flowers solitary in the axils of leaves on slender square pedicels up to about .5 inch long. Calyx superior with 5 lanceolate spreading lobes. Corolla 2-lipped; tube cylindrical, splitting along the back; lower lip of 3 ovate lobes with raised claw-like areas in the two sinuses between them, raised areas white, the surface of the lobes pale blue, violet round the raised areas; upper lip 2-lobed, lobes ovate, curled back, white. Stamens 4; filaments free; anthers joined, black, with a silvery brush-like appendage on each, standing outside the corolla tube at the back in the later stage of the flower. Ovary 2-celled; style as long as the stamens; stigma spherical. Capsules ovoid bearing the persisting calyx lobes. Seeds numerous, ovoid, triangular in cross-section, brown, glabrous, .5 m.m. long.

In rice fields near Tambaram. Flowers and sets seed from January to March.

Diospyros Ebenum, Koenig. The Ebony Tree.

Plate II-C

A small tree, the branches with a drooping habit; branchlets green, round, glabrous. Bark thin, brownish-grey, with longitudinal cracks. Plants male or female. Leaves alternate, narrowly ovate, up to about 4.5×1.75 inches, tip rounded, the two sides somewhat folded together, leathery, margins entire and wavy, both surfaces glabrous, bright green, young leaves yellowish-green drying black; nerves rather obscure, secondary veins arching together irregularly, finer veins reticulate. Flowers sweet-scented. Male flowers mostly in 3-flowered cymes on short peduncles in leaf axils. Calyx cup-shaped,

with 4 small glabrous rounded lobes, tips minutely apiculate, margins very finely ciliate. Corolla white, .5 inch across ; tube broad, tapering to the mouth, .25 — .4 inch long ; lobes 4, ovate, overlapping to the right. Stamens 16 ; filaments branched and each bearing 2 anthers at 2 levels ; anthers 2-celled with a straight beak at the tip. Ovary infertile, flattened, shallowly 8-lobed. Female flowers solitary in leaf axils, pedicels .1 inch long. Bracts 2, small, ovate, with scattered silky hairs, soon falling. Calyx lobes 4, ovate-triangular, spreading, forming a square with hollow sides, thick, minutely pubescent. Corolla white, .7 inch across ; tube ovoid ; lobes 4, ovate-triangular, overlapping to the right, tips curved back. Staminodes 8, flattened, attached at the base of the ovary, each in a recess in the corolla tube. Ovary ovoid, narrowed to a stout style which is cleft near the apex into 4 spreading somewhat concave stigmatic lobes. Fruit globose, slightly broader than long, .6 to .75 in across, the calyx forming a shallow woody cup at the base the lobes being reflexed, 6- to 8-seeded. Seeds shaped like the section of an orange, up to about .5 inch long, with a median line along the curved surface, light chocolate-brown, surface smooth and waxy, albumen uniform.

Fairly common on the Tambaram and Vengambakkam Hills. Flowers in February and March ; fruit ripens in August. The Flowers turn cream-coloured on fading and become black when dry or when preserved in formalin.

Secamone, R. Br.

Climbing or straggling shrubs or undershrubs. Leaves opposite. Flowers small or minute, in lax axillary sessile or shortly peduncled 2- or 3-chotomous cymes. Calyx 5-lobed, eglandular. Corolla small, rotate, 5-lobed, the lobes overlapping to right or left ; coronascales 5, joined to the staminal column, compressed. Stamens inserted at the base of the corolla ; filaments short, free or joined at base ; anther-tips inflexed and connivent round the style-apex ; pollen-masses small, in pairs in each cell, attached in fours to a minute pollen-carrier without caudicles. Ovary of 2 carpels, many-ovuled ; style columnar, dilated, ending in a flattened ring and produced above it. Fruit of 2 diverging smooth follicular mericarps. Seeds oblong, flattened but ridged, ending in a long white silky coma.

Secamone emetica, R. Br.

An extensively climbing plant with wiry stems twining to the right ; nodes abruptly and much enlarged when giving rise to branches. Leaves opposite, lanceolate, occasionally linear, sub-acute at apex and base, $2 \times .65$ inches, glabrous on both surfaces ; midrib depressed on upper surface, raised below ; nerves straight, obscure ; petiole about .15 inch. Flowers in short cymes in leaf axils. Bracteoles broadly ovate, acute ; peduncles and

pedicels rusty-pubescent ; sepals rounded ; corolla glabrous, about .2 inch across, lobes, oblong, obtuse, with saccate bases, bright yellow ; coronal scales narrow, laterally flattened, incurved, much shorter than the column ; stigma 2-lobed. Follicles widely diverging, straight, 3.5 inches long, .2 inch wide gradually tapering, outer surface rounded, inner flat, glabrous, slightly ridged longitudinally, dehiscing by splitting along a line along the middle of the flat surface. Seeds few, brown, boat-shaped, about .4 inch long, bearing at one end a diverging brush of silky hairs about 1.5 inches long.

Common on the Vandalur and Vengambakkam Hills climbing over bushes. Found in flower in August. South Indian specimens of this plant in flower in Kew Herbarium were collected in May, July, August and November. Ripe follicles found in April.

Tylophora, R. Br.

Erect or twining perennial herbs or under shrubs. Leaves opposite. Flowers small, in axillary or lateral simple or branched umbelliform cymes of flower-clusters or short racemes scattered along them. Calyx 5-partite, glandular within ; lobes ovate or lanceolate. Corolla rotate or rotate-campanulate, deeply 5-lobed, the lobes slightly over-lapping to the right ; corona of 5 small fleshy tubercular processes joined to the lower part of the staminal-column. Staminal-column arising from the base of the corolla ; anthers erect, small, with small inflexed membranous appendages ; pollen-masses minute, usually horizontal, attached by their middle or near their base by very slender usually short caudicles to the pollen-carriers. Ovary of 2 carpels ; style apex pentagonal or 5-lobed, flattened or convex, rarely exserted. Fruit of 2 (or, by abortion 1) follicular mericarps, smooth, usually acuminate. Seeds flattened, ovoid, margined, ending in silky coma ; cotyledons elliptic ; radicle cylindric.

Tylophora asthmatica, Wt. & Arn.

A climbing slender-stemmed plant. Stems round, softly hairy. Leaves variable in shape and hairiness, usually ovate, oblong or rounded, base usually cordate, apex acute or acuminate, up to about 2.5 × 1.5 inches, glabrous or pubescent ; petiole about .5 inch long. Peduncles in leaf axils, usually shorter than the leaves, cymously branched and bearing 2 or 3 umbels of flowers, pubescent ; pedicels slender, about 1 inch long. Flowers .25 inch across ; sepals long-lanceolate, hispid ; corolla with large shortly acute lobes, dull yellow, purple within ; coronal processes gibbous or globose with cuspidate tips. Follicles diverging, round in cross-section, acuminate, up to about 3 inches long, smooth, glabrous. Seeds broadly ovate, .3 inch across, with a white silky pappus about 1.5 inches long.

Common in all East Coast districts in hedges and thickets. Madras City, Poonamallee.

Hoppea, Willd.

Small, much-branched glabrous herbs. Leaves opposite, small, sessile. Flowers sessile or short-pedicelled, in 2- or 3-chotomous cymes, small. Calyx campanulate, membranous; lobes 5, lanceolate. Corolla tubular; lobes 4, more or less unequal. Stamens inserted in the throat of the corolla, 1 perfect, 3 barren or wanting; filament linear, short; anther ovate, with parallel cells. Ovary 1-celled, placentas little intruded; style short, stigma 2-lobed. Fruit a globose or ellipsoid capsule, septicidally 2-valved. Seeds very many, minute, obscurely reticulate.

Hoppea dichotoma, Willd.

Plate III-D

A small erect much-branched herb, usually 2 to 3 inches high or less. Stem square, slightly winged at the angles. Leaves opposite, sessile, ovate, acute, glabrous, about .25 inch long. Flowers almost sessile, in dichasial cymes. Calyx lobes 4, lanceolate, with a green thickening or rib along each margin, apex acute, .1 inch long. Corolla narrowly bell-shaped with 4 triangular outward-pointing teeth, about as long as the calyx, greenish-yellow. Stamens inserted on corolla tube, only one developed. Capsule elipsoid, opening at the top by four valves that curl outwards. Seeds irregularly spherical, almost black, glossy, with rounded tubercles, .25 m.m. across.

In moist grassy places near Tambaram. Appears and flowers in February and March when conditions have begun to get dry.

Tricodesma zeylanicum, R. Br.

A hispid annual herb growing up to 5 feet high. Stems green, round, with small spine-like hairs on raised red bases. Leaves opposite and alternate, narrowly ovate, sub-acute at apex, narrowed at the base, up to 7×2.3 inches, harsh with small stiff hairs; veins curved, depressed on upper surface, prominently raised below; petiole up to about .25 inch, absent in upper leaves. Flowers numerous, in drooping paniculate cymes at the end of branchlets. Pedicels up to 1 inch long, with long silky hairs. Calyx lobes ovate-lanceolate, base rounded, apex acute, with long silky hairs on the back, glabrous inside, .5 inch long, enlarging in fruit. Corolla .5 inch across, lobes broadly obovate, apex acuminate and spirally twisted, without glands, pale blue with pink patches between the lobes. Stamens joined to form a slender cone, with silky hairs on the back, the ends drawn out to long ribbon-like twisted tails. Ovary glabrous; style long, slender. Nutlets smooth, black and glossy on outer surface, brown and rough on inner surface, triangular, about .15 inch across.

On dry open land. Tambaram (College Compound.) Flowers and sets seed in January. The sharp hairs of the stem break off in the skin and are irritating.

Limnophila racemosa, Benth.

Plate III-B

An annual water plant having an aromatic smell. Roots white. Stem narrow near the root, then for a foot or so resting on the mud at the bottom of the water and becoming thick and reddish and bearing whorls of filiform leaves, and then becoming erect and green and rising about a foot above the surface of the water and bearing lanceolate leaves and flowers. Flowers arranged in long racemes ; on the lower part of the raceme there are 3 flowers and 3 cordate bracts at a node, on passing upwards the flowers become less exactly opposite and the bracts smaller, on the upper part the flowers are arranged spirally. Pedicels about .25 inch long. Calyx of 5 equal lanceolate lobes joined for a little more than half their length, covered with fine gland-tipped hairs. Corolla nearly .75 inch long, about .5 inch wide at the mouth ; tube narrowly funnel-shaped, slightly dilated near the base, then slightly flattened and somewhat curved, yellow, with fine purple longitudinal veins on the upper side ; lower lip of 2 roundish lobes fused together, very pale mauve with a violet patch near the centre of each lobe, with a dense patch of hairs at the base and scattered hairs elsewhere ; upper lip 3-lobed, middle lobe cordate, side lobes roundish or bluntly triangular, very pale mauve, with scattered hairs. Stamens 4, 2 longer and 2 shorter, the lower half of the filaments attached to the corolla tube, anthers of each pair joined together. Ovary bright green, spherical, tapering above ; style single, white or greenish, glabrous, .25 inch long ; stigma spatula-shaped, turned at right angles to the style. Capsule broadly egg-shaped, splitting into 4 valves. Seeds numerous, bluntly wedge-shaped, dark-brown, about 0.5 m.m. long.

The transition from filamentous leaves below water to lanceolate ones above water is interesting. At intervals along the thickened horizontal part of the stem below water there are whorls of about 20 brown filamentous leaves up to about $1\frac{1}{2}$ inch long consisting of a main thread from which a number of branches emerge and these side-branches are themselves branched towards their ends. On the lower part of the upright portion of the stem the filamentous leaves become more numerous (30) and shorter. A little higher up, the leaves, while remaining filamentous, become shorter and thicker and are green near the stem and brown at the tips. A little below the surface of the water, the filaments become fewer and are flattened and simply branched and stand out stiffly round the stem. At about the surface there are 3 sessile lanceolate leaves with toothed margins, the teeth being sometimes branched, between the 3 leaves there are a few flattened filamentous leaves. Above water there are 3 sessile lanceolate leaves at each node ; the lower of these leaves have divided or rounded tips and the upper ones acute tips ; they have each about 5 parallel nerves. The filamentous submerged leaves are obviously homologous with the nerves of the upper leaves.

Common in pools along the Chingleput Road between Tambaram and Vandalur. Flowers and seeds in January.

Limnophila polystachya, Benth.

Plate III-A

An annual aromatic marsh plant. Stems white, pale green or pinkish, dark red at the nodes, usually erect, sometimes the lower portion resting horizontally on the mud. Leaves varying from whorls of branched filaments to sessile lanceolate green leaves three at a node as in *L. racemosa* (see above); aerial leaves finely serrate. Flowers in spikes at the end of the stem and in the upper axils. Calyx lobes narrowly ovate, acute, glabrous. Corolla .4 inch long, white or pale pink with pale purple veins; upper lip of three ovate-triangular lobes; lower lip of a broad slightly bifid lobe; tube funnel-shaped with long hairs in the throat. Stigma spoon-shaped, bent. Capsule splitting into 4 valves. Seeds reddish-brown, bluntly wedge-shaped, about .25 m.m. long.

Growing plentifully at Puttur near Tambaram in drying tank beds and in rice fields. Flowers from the end of January till early March.

Ilysanthes hyssopioides, Benth.

A slender marsh herb rarely attaining 6 inches in height. Stems square, winged at the angles, unbranched or branching only from the base. Leaves linear, lower ones occasionally lanceolate, under .5 inch long. Flowers solitary in leaf axils, usually only one flower from each node. Pedicels thread-like, up to about 1.1 inch long, deflexed when in fruit. Calyx lobes lanceolate, about .1 inch long. Corolla 2-lipped, .5 inch long, pale blue; tube broad, compressed, narrowly funnel-shaped; lobes spreading, semicircular or ovate. Stamens 2 perfect with short filaments and united anthers, standing at about the middle of the tube; 2 staminodes having long hairy filaments joined to the corolla tube for their whole length, and club-shaped, hooked, yellow upper ends at the mouth of the corolla tube. Style about as long as the corolla tube; stigma spherical. Capsule ovoid, about .15 inch long. Seeds numerous, yellowish-brown.

Common in marshy places round Madras, Tambaram, Red Hills. Flowers January till March. This plant is widely distributed, and is found in both East and West Coast districts and up to high elevations on the hills.

Ilysanthes serrata, Urban

A small annual herb. Stems numerous from the base, spreading and erect, up to about 2.5 inches long, square, grooved on two sides, not rooting at the nodes. Leaves opposite, ovate or ovate-oblong, up to 1.2 inches long and .45 inch broad, sessile, rounded or somewhat narrowed at the base, apex rounded, margins deeply and closely serrate, the teeth bristle-pointed, glabrous on both surfaces, veins obscure. Flowers in lax terminal racemes. Bracts linear with acute tips. Pedicels short and thick. Calyx lobes long,

narrow, tips very acute. Corolla tube very slender, .2 inch long; lower lip with three broad rounded lobes, .2 inch wide, white with deep pink blotches; upper lip oblong, narrow, notched. Stamens 2 fertile; 2 reduced to curved linear pink and white staminodes attached to the lower lip of the corolla by a claw. Capsule narrow, cylindrical, .3 inch long, 2-celled, 2-valved. Seeds very numerous, black, surface covered with round pits, about .4 m.m. across.

Growing in moist places in open ground at Tambaram (College compound). Flowers and sets seed in January.

It is found growing in association with *Vandellia crustacea*, Benth. and *Osbeckia zeylanica*, Willd.

Striga orobanchoides, Benth.

An erect, somewhat fleshy, parasitic plant. Stems round, widened below each node, up to about 6 inches high in local specimens, dark red, glabrous, slightly warty as seen by a lens, base below ground nodular giving out a few wiry roots. Leaves opposite or sub-opposite, up to about .25 inch long, ovate or bluntly triangular, thick and fleshy, pressed against the stem, red, with a few stiff white hairs near the tip. Spikes up to about 40-flowered. Bracts similar to leaves but usually more acute at the tip, shorter than the calyces. Bractioles much narrower. Calyx .25 inch long, square in cross-section, with 4 thick triangular lobes, the fifth lobe reduced to a scale at the back sinus. Corolla .3 inch wide; upper lip broad, obscurely 2-lobed, pink, becoming white and densely hairy in the throat; lower lip divided into 3 ovate lobes, pink becoming white at the base; tube .3 inch long, lower half yellow and glabrous, upper half pinkish, hairy, somewhat dilated and curved. Stamens 4; anthers narrow, black; filaments attached to the corolla tube. Seeds roughly oblong, about .3 × .12 m.m., brown, with longitudinal slightly spirally-twisted ridges.

In dry rocky places. Lower parts of Vandalur Hill, Nanmangalam Hill and Tambaram (College compound).

Flowers in January. Several specimens examined were found to be parasitic by their roots on *Lepidagathis cristata*, Willd.

Sopubia delphinifolia, G. Don

Fyson in his *Flora of the South Indian Hill Stations*, page 432, states that this plant is a root parasite but gives no further information. This plant grows in marshy ground near Tambaram. A number of plants growing amongst grass were dug up with as much earth as possible. On washing away the earth several were found to have their roots attached parasitically to the roots of a grass which has been kindly identified by Mr. Fischer as *Chrysopogon montanus*, Trin.

Centranthera, R. Br.

Scabrid herbs, probably more or less parasitic. Leaves opposite or the upper alternate, entire or toothed. Flowers axillary or in bracteate spikes or racemes; bracteoles 2. Calyx spathaceous, split on one side, compressed, entire or shortly 3 to 5-lobed. Corolla-tube long, tubular or funnel-shaped, incurved and dilated above; limb oblique; lobes subequal, spreading, the 2 upper inside in bud. Stamens 4, didynamous, included; anthers meeting in pairs, cells transverse, spurred or mucronate at base; one cell often imperfect. Ovary with many ovules; style simple, dilated above; stigma tongue-shaped, acute. Fruit an ovoid or sub-globose loculicidal capsule; valves entire, the placentas in the middle. Seeds very many, conical or wedge-shaped; testa lax, reticulate.

Centranthera humifusa, Wall.

Plate III-C

A small marsh herb. Roots reddish-orange. Stems up to about 4 inches, erect or prostrate, branched near the base, green or red, grooved on two opposite sides, the grooves being above the leaves. Leaves sub-opposite alternate, linear, sessile, under 1 inch long, entire, glabrous, rough. Flowers solitary in leaf axils, sessile. Calyx spathaceous, ovoid, with a backwards-pointing tip, 0.2 inch long, green becoming reddish on the upper half, somewhat tubercular-hispid. Corolla narrowly funnel-shaped, slightly curved at base, with 5 almost equal rounded lobes, .6 inch long, tube brownish-red within, lobes yellow. Stamens 4, attached to the base of the corolla tube, 2 slightly longer than the other 2; filaments flattened, upper ends curved, the longer with long yellow hairs covering the whole of one side from the attachment upwards, the shorter with a tuft of hairs on one side above the middle; anthers white with a pointed spur. Ovary ovoid, bright green; style long, curved; stigma spatulate. Capsule ovoid, splitting into 4 valves. Seeds numerous, bluntly conical, yellowish-brown, surface reticulate.

Growing in marshy ground at Puttur and Vandalur and other places near Tambaram. Flowers in December and January.

This plant has previously been reported from the East Coast (Tada), but it is more frequently found on the West Coast. In the Flora of Madras Presidency the filaments are described as glabrous. This is not the case with specimens found in this area.

Utricularia caerulea, Linn.

A very slender annual plant of moist places. Leaves about .25 inch long; blades green, spatulate. Bladders with wide mouths and long slender beaks. Scapes up to 7 inches long, usually shorter, slender, erect, purplish or green. Scales of the scape and bracts

attached by their middles, both halves narrow and acuminate. Flowers sessile or with very short pedicels, about .25 inch long. Sepals 2, round, concave, pale brownish-purple. Upper lip of corolla small, erect, ovate, indented at the upper end, uniformly purple; lower lip broadly ovate-triangular, convex, purple, with a raised palate; palate with a yellow patch at the mouth from which four white parallel ridges run out and then turn down at right-angles forming a step; spur much longer than the lower lip, slenderly conical, standing more or less at right-angles to the scape, the tip curving upwards. Capsule spherical. Seeds minute, yellow, surface furrowed or obscurely reticulate.

Common on moist ground round the margins of ponds and in rice fields near Tambaram. Flowering December to February. This does not appear to have been previously reported from the Carnatic.

*** *Utricularia caerulea* Linn. var *filicaulis*, C. B. Clarke.**

A minute plant. Leaves numerous, .25 inch long; blade green, spatulate, .12 inch long; petiole white. Bladders very small, with wide beaked mouths. Scapes single, erect, very slender, up to about 3 inches long, sometimes branched, round, green becoming dark purplish near the base, up to 6-flowered, but usually with only 2 or 3. Scales and bracts of the scape attached by the middle, acute at each end. Flowers almost sessile, .2 inch long, only one opening at a time. Calyx lobes 2, broadly ovate or circular, concave, mucronate, reddish-purple. Corolla 2-lipped, white or very pale yellow; upper lip small, oblong; lower lip inflated with a turned-up margin, having a yellow patch at the mouth; spur narrowly conical, slightly curved, pointing outwards at right-angles to the scape. Capsule globose. Seeds numerous ovoid, 0.15×0.2 m.m. brown, glossy, longitudinally grooved.

Common in the neighbourhood of Tambaram on the margins of ponds, in rice fields and in moist places amongst grass. Flowers and seeds in January and February.

***Utricularia Wallichiana*, Wt.**

Plate III E

A very small annual marsh plant. Leaves about .25 inch long; blade narrowly spatulate, green; petiole white. Bladders round with a wide mouth and a longish pointed beak. Scapes very slender, irregular, erect or twining to the right, round, darkish-green, up to 3.5 inches long, often not more than 1 inch. Scales of scape and bracts attached by

* Since correction of the last proof, information has been received from Prof. F. E. Lloyd (McGill University) that this plant may prove to be distinct from *U. caerulea* Linn., and that a superficially similar plant also from Tambaram is probably a new species. This name and the key should therefore be regarded as liable to alteration.

their bases, narrow, very acute at apex, light green or brownish. Pedicels about .06 inch long. Sepals 2, very acute at apex, truncate at base, brownish- or greenish-yellow. Upper lip of corolla small, triangular obtuse, yellow; lower lip circular, with a raised bluntly conical centre, uniformly yellow; spur longer than the lower sepal, slender, curved, flattened, pale yellow. Capsule flattened. Seeds ovoid, bluntly pointed at each end, obscurely furrowed longitudinally, about $.2 \times .13$ m.m., yellowish-brown.

Common on moist ground on the maidan to the east of the College site at Tambaram and in the shade of bushes at the foot of Vandalur Hill. Flowers December till February. This plant is well known on the hills of S. India where the scape attains a length of a foot or more, but it has not previously been reported from low levels on the East Coast.

Utricularia stricticaulis, Stapf

Plate III D

A small annual marsh plant. Leaves very narrow, up to about .5 inch long, the blades resting on the mud. Scapes single, relatively stout, cylindrical, smooth, bright green, narrowed and reddish at the base, up to 5.5 inches long, bearing up to 9 flowers. Scales of scape attached by the base, short, acute, pale green. Bracts fixed by the base, one broad and two narrow at the base of each pedicel. Pedicels flattened, about .25 inch long. Sepals broadly ovate, acute at both ends, pale green. Corolla about .4 inch long; upper lip broadly ovate, blue or bluish-purple, paler at the base and with numerous dark blue radiating striations; lower lip hemispherical with a large raised palate or cushion, bluish purple with darker markings on the palate; spur longer than the lower sepal, narrowly conical, flattened, slightly curved, the tip pointing downwards or slightly outwards. Capsule lenticular. Seeds almond-shaped, $.26 \times .13$ m.m. brown, with obscure longitudinal furrows.

This appears to be by far the commonest *Utricularia* found near Madras. Common on borders of ponds and in rice fields near Tambaram. Grows in striking profusion in shallow ponds near the seashore between Elliot's Beach and Tiruvanmiur. Flowers from December to March. The flowers have a scent suggestive of violets.

Dolichandrone, Fenzl.

Trees. Leaves opposite, pinnate, the leaflets entire or obscurely toothed. Flowers few, opening at night, usually white, large or moderate-sized, in terminal corymbs or panicles. Calyx spathaceous, cleft to the base on one side. Corolla-tube long or short; lobes 5, nearly equal, crisped on the margin. Stamens 4, in two unequal pairs, included; anthers glabrous, the cells parallel. Disk annular. Ovary sessile; ovules numerous, many-seriate;

style long ; stigma 2-lobed. Fruit a long subterete or compressed capsule, loculicidally 2-valved ; the septum narrow with a transverse false septum, making seemingly 4 cells. Seeds much compressed, almost rectangular, with broad wings on each side ; cotyledons usually broader than long, emarginate.

***Dolichandrone falcata*, Seem.**

Plate IV A

A small tree branching from the base upwards. Bark light ashy-grey, smooth ; ends of twigs grey, furry. Cotyledon leaves having two orbicular lobes ; leaves of seedling simple, ovate, acute at apex, acuminate at base, bright green, glossy. Leaves of mature plant opposite, pinnately compound, with 7, 5 or 3 leaflets, about 3.5×1.5 inches ; side leaflets irregularly orbicular, sometimes broader than long, apex flattened or slightly indented, with short petiolules ; end leaflet much larger than side ones, orbicular or obovate, acuminate or straight or slightly cordate at base, petiolule about half as long as the leaflet ; rachis and both sides of leaflets finely tomentose and scurfy, greyish-green. Flowers usually one or two at the ends of branchlets, having a heavy sweet scent. Calyx spathaceous, pubescent, .75 inch long. Corolla white, about 1.25 inches long, tube narrow, mouth trumpet-shaped, lobes crumpled. Stamens 4, in the corolla tube, anthers large. Style long ; stigma 2-lobed. Fruit a capsule resembling a pod, sickle-shaped, with a spiral twist, up to about 20 inches long and .75 inch wide, margin slightly wavy, 2-celled and with a median depression on both sides indicating the septum, parts exposed to the sun dark greenish- or brownish-red, shaded portions green, whole surface irregular and scurfy. Seeds in two rows in each cell, the rows separated by a thick layer which is first fleshy and then corky but with a glossy surface. Seeds oblong, flattened with an oblong wing at each end, $1 \times .7$ c.m. ; envelope of seed corky ; wings scaly, ends irregularly frayed, up to 1.4 c.m. long.

Common in scrub jungle, usually in dry stream beds and sandy places. Tambaram (College compound), Vandalur, Selaiyur Reserve. Flowers during July and August. The capsule ripens slowly and remains on the tree for some months after shedding the seeds, and so that immature or dehiscent capsules are to be found on the tree throughout the year.

***Cardanthera*, Buch.-Ham.**

Aromatic, often viscid herbs. Leaves opposite, the upper toothed, rarely entire, the lower often pinnatifid, or if submerged, pectinate. Flowers in spikes or axillary whorls or 1-3 in the leaf-axils ; bracts and bracteoles foliaceous, but often suppressed. Calyx 5-partite, the lobes narrow, often unequal. Corolla-tube straight ; limb 2-lipped, the upper erect, 2-lobed, the lower 3-lobed with a transversely plaited palate. Stamens 4, in

unequal pairs, anthers of the posterior pair often smaller, cells parallel. Ovary narrow, 2-celled ; ovules many ; style slender ; stigma linear, bent. Fruit a narrow 2-celled capsule, many-seeded throughout. Seeds very many, small, ovoid ; retinacula minute, conical, straight.

***Cardanthera balsamica*, C. B. Clarke**

An erect branching annual herb with an aromatic smell. Roots white, numerous from the condensed base of the stem. Stem round near the base, with a dense centre and a spongy outer zone, square and slightly ridged on opposite sides above, up to 2 ft. high. Leaves opposite, lanceolate or oblong-lanceolate, sessile, shallowly serrate-crenate, lower leaves often pinnately dissected into narrow branched segments, glabrous but with a pubescent or hairy patch on the upper side at the base, upper surface somewhat sticky, up to 3 inches long. Flowers in axillary whorls, usually 2 at each node open at the same time, about .5 inch long. Calyx funnel-shaped with 4 lanceolate lobes and an upper ovate lobe ; tube white, pubescent ; lobes green, glabrous. Corolla 2-lipped, pale blue to pink ; tube funnel-shaped ; upper lip bluntly triangular with 2 small overlapping lobes at the tip, having two grooves on the back ; lower lip broad, convex, obscurely 3-lobed, with a palate covered with a network of purple or violet depressed veins, with scattered hairs. Stamens 4, 2 longer and with larger anthers than the other 2. Ovary green, elongated, pubescent ; style filiform, pubescent, with a linear stigmatic surface on one side near the bent tip. Capsules narrow, 2-celled, pale brown, pubescent, .25 inch long, opening explosively and scattering the seeds. Retinacula short, bluntly conical, occasionally inclined to the septum but not hooked. Seeds numerous, ovoid, reddish-brown, .4 to .5 m.m. long, hygroscopically hairy.

Very common in drying rice fields and tanks. Puttur, Tambaram, Poonamallee. Flowers in February and March. Capsules ripen in March. This plant is able to produce normal-sized flowers when very small. Large areas of drying tank beds and rice fields are often covered with plants from less than one inch to a few inches high but flowering freely. When the flower first opens the tip of the style is pressed back against the upper lip of the corolla and the anthers are held a little forward so that an insect coming to the mouth of the corolla is likely to get dusted with pollen. At a later stage the filaments curl and draw the anthers down into the tube and the style curves down a little so that the stigmatic surface is likely to come into contact with an entering insect. This arrangement ensures cross-fertilization.

This plant is in many respects very similar to *Hygrophila angustifolia*, R.Br. Diagram B on Plate XXXI of the Flora of Madras City is almost certainly of *Cardanthera balsamica* and not *H. angustifolia*. The latter is not recorded as occurring in the Carnatic. The two

plants may be distinguished by their bracts; in *H. angustifolia* the bracts are long-acute at the apex and the upper margins bear stiff bristle-like hairs; in *C. balsamica* the tips are blunt or sub-acute and the margins are without prominent hairs.

***Stenosiphonium Russellianum*, Nees, var. *subsericeum*, T. And.**

This variety differs from the species in being a low straggling woody plant usually with small leaves which are white-silky on the under surface. The older leaves are silky or glabrous below. The seeds are more or less heart-shaped, brown, with a dull glabrous surface except for a roundish sticky-looking patch on each side; on moistening with water they become surrounded with long silky hairs; on again drying the hairs become firmly attached to the surface on which the seed rests, and so the seed is anchored.

Common on the Tambaram Hills. Flowers in March.

***Andrographis elongata*, T. And.**

Plate IV-B

A straggling herb. Stems wiry, square, narrowly winged at the four angles, dark green, practically glabrous, nodes widely separated, twisted through about a right angle between each two nodes. Leaves ovate, apex blunt, base acuminate, up to about 3 inches long, sessile, margin entire, both surfaces glabrous, green or reddish. Flowers in rather distant-flowered racemes in leaf axils and at the ends of branches, the lower racemes with several branches. Bracteoles subulate, short. Pedicels about .125 inch. Calyx lobes lanceolate, covered with gland-tipped hairs. Corolla obscurely two-lipped, glandular-hairy outside; 2 side lobes of upper lip pale yellowish-green spotted with pale crimson; mid-lobe of upper lip and two lobes of lower lip white or pale pink with scattered pale crimson spots. Filaments glabrous; anthers reddish-purple. Style glabrous, upper end purplish, pointed. Capsule about .8 inch long, finely glandular-hairy, acute at tip, about 8-seeded. Seeds dull brown, like chipped arrow heads, about 1.75 m.m. long.

Common straggling amongst undergrowth in the neighbourhood of Tambaram. Puttur, Mullumalai, Vandalur. Flowers in February and March, and sets seeds in March and April. In the Flora of Madras Presidency this plant is reported only from evergreen forests of the Tinnevely hills.

***Barleria longiflora*, Linn. f.**

Plate IV-C

A small unarmed much-branched shrub. Branches round, straight, finely tomentose. Leaves narrowly to broadly ovate, acute, or sub-acute at apex, up to 1.6 × 1.4 inches usually smaller, softly velvety on both surfaces with very fine glandular hairs, light greenish-grey, midrib and main nerves standing out below; petiole up to about 1 inch.

Flowers scattered along the upper branches singly in leaf axils or on few-flowered cymose branches. Bracts linear, acute, glandular-tomentose, about .75 inch long. Two outer calyx lobes pressed together, broadly ovate, truncate or sub-cordate at the base, very pale green with a prominent dark-green network of veins, becoming pale brown and scarious in fruit, .9 × .65 inches; two inner calyx lobes small, narrow, surrounding the base of the corolla tube. Corolla white, 4 inches long or longer, 1.6 inches wide; tube slender, tapering slightly from base to about .5 inch below the mouth and then becoming narrowly funnel-shaped, with 5 spreading broadly ovate lobes, the 2 lower slightly smaller than the other 3, tube and backs of lobes finely hairy. Stamens 4, 2 with small but fertile anthers standing near the base of the funnel-shaped part of the corolla tube and with only about .1 inch of their filaments free, 2 with large anthers standing about .25 inch above the mouth of the tube, the filaments of the short stamens hairy and the filaments of the long stamens covered with long hairs at the level of the short stamens. Ovary green, narrowly ovoid; disc clasping the lower half of ovary and having an irregular margin; style about 3.75 inches long, threadlike; stigma very small, truncate. Capsule, .6 inch long, compressed; retinacula acute, upward-pointing. Seeds flattened, cordate, reddish-brown, with long white silky appressed hairs which on moistening with water become erected.

Common on Vandalur and Vengambakkam hills growing amongst rocks at elevations of 300 feet and above. Flowers and sets seeds November to February.

Vitex altissima, Linn. f.

A small to moderate-sized tree in this area; branchlets square; bark smooth, grey. Leaves opposite, with three leaflets, aromatic when crushed; leaflets lanceolate to narrowly ovate, apex acuminate, base acute, almost sessile, slightly pubescent especially on the veins; petiole slightly winged at the base, channeled above. Flowers in cymose panicles at the ends of branchlets, .2 in. long; calyx funnel-shaped, cream-coloured, pubescent; corolla pubescent, pale blue, lip violet, yellow in throat; anthers black; apparently only one flower on each cymose branch develops to a fruit. Fruit a drupe about .3 inch across, dark purple with obscure white spots; pulp purple; pyrene bony, spherical, blackish, with obscure longitudinal grooves, 4-celled.

Vandalur at the foot of the hills, Pachaimalai. Flowers in August. Fruit ripens in January. Under favourable conditions this tree grows to a large size and yields a useful timber.

Vitex altissima, Linn. f. var. *alata*.

Plate IV-D.

A shrub or small tree in this area. Leaves with three leaflets. Leaflets lanceolate to narrowly ovate, sessile, acuminate at both ends, nerves numerous and curved, up to 6 × 2 inches; petiole up to 4 inches long, broadly winged especially in young plants; wing rounded at the upper end and auricled at the base, up to about .9 inch wide.

Frequently found in scrub jungle at Tambaram (College compound) but it has not yet been seen in flower. This variety is described as differing from the type only in the broadly winged petiole.

Anisochilus, Wall.

Herbs or undershrubs, often fleshy. Leaves opposite or whorled. Flowers small, in dense tetragonal or cylindrical or slender whorled spikes, the floral leaves and bracts often early-dropping, red glands often covering especially the corollas. Calyx suberect, inflated below the middle, 2-lipped or 5-lobed, rarely 1-lipped, the upper lip often entire and much deflexed, the lower short, truncate or minutely lobed. Corolla 2-lipped, the tube slender below, inflated above and decurved; upper lip entire or 3- or 4-lobed, lower elongate, concave. Stamens 4, in unequal pairs, curved forwards, filaments free. Disk lobed. Ovary 4-partite; style bifid at apex. Fruit of four ovoid dry nutlets, basal scar small.

Anisochilus eriocephalus, Benth.

An erect herbaceous plant up to about 18 inches high. Stems thick, obscurely 4-sided. Leaves opposite, broadly ovate, obtuse, shallowly cordate at base, thick, very finely and softly glandular-hairy below, margin shallowly crenate, up to 1.3×1.5 inches; petiole up to .9 inch. Peduncles slender, red, very finely glandular pubescent, branched; branches opposite and at right angles to the main peduncle. Spikes ovoid-conical, up to $.9 \times .45$ inch. Upper lip of calyx hemispherical, acute at front, dark reddish-green, lower lip truncate, densely fringed round the mouth with long silky hairs. Corolla with a very slender tube which is bent and then enlarges to a compressed funnel-shaped mouth; upper lip erect, obscurely 4-lobed; lower lip boat-shaped horizontal; the narrow part of the tube and the two lips violet, the funnel white. Stamens 4, 2 slightly longer than the other 2. Stigma slightly forked at the tip. Stigma and anthers in the boat-shaped lower lip of the corolla. Seeds 4, almost black, glossy, broadly ovoid, somewhat flattened on three sides, about 1 m.m. long.

On the side of Unamalai growing in crevices in rocks exposed to the sun. Flowers in January. The spikes have a bronzy lustre. Ripe seed found in March and April.

Leucas biflora, R. Br.

An herbaceous plant of variable habit growing in tufts amongst grass or straggling amongst shrubs or undergrowth. Stems up to 3 feet long, slender, green, square, hairy especially along the angles. Leaves 2 at a node, ovate, rounded or bluntly wedge-shaped at base, sub-acute at apex, coarsely crenate, softly hairy, nerves strongly raised on under side, under 1 inch long; petiole only about .12 inch. Flowers 2 at a node. Bracts short, linear.

Calyx .25 inch long, narrowly campanulate, 10-ribbed, mouth straight, teeth 10, acute, about .1 inch long, ciliate. Corolla white; lower lip broad, flat, with two spatulate side-lobes and a longer obscurely 4-lobed middle lobe; upper lip narrow, convex, densely hairy externally and on the margin. Stamens 4, 2 slightly longer than the other 2, bent at upper end which is inside the upper corolla lip; anthers small, scarlet. Style divided near the tip into two unequal pointed branches. Nutlets 4, 3-sided, bluntly wedge-shaped, about .06 inch long.

Common at Tambaram, Vandalur and Puttur. Flowering throughout the cooler months of the year.

***Loranthus longiflorus*, Desv.**

Plate V-A

A parasitic shrub. Branches woody, enlarged at the nodes, running along and parasitic on the branches of trees and large shrubs. Bark smooth, grey with numerous silvery grey branching lines. Branchlets round, smooth, green. Leaves opposite and subopposite, narrowly ovate, up to about 6×2 inches, with very short petioles, apex blunt, thick, leathery, yellowish-green, glabrous, mid-rib and irregularly branching veins standing out slightly on both surfaces. Flowers in many-flowered racemes in leaf axils. Pedicels .2 inch long. Bract at base of calyx short, bluntly pointed. Calyx glabrous; mouth straight, slightly spreading. Corolla about 2 inches long, glabrous; tube yellow, pale orange or reddish, sometimes splitting for part of its length, lower half narrow and straight, upper half dilated and curved; lobes 5, .4 inch long, strap-shaped, acute at apex, curling inwards, outer surface green, a dark green ring at the base; inner surface dark red or green below, light green above. Stamens 5; filaments short, attached at base of corolla lobes, pubescent; anthers elongated, attached for their whole length on the same side of the flattened filament end, back of filament end red. Ovary one-celled, sunk in the calyx; style thread-like, 2 inches long; stigma small, spherical. Berries ovoid-oblong.

Common in a restricted area on the Vengambakkam Hills to the south of Tambaram but not elsewhere in the district. Flowers in February and March. The plants seen were parasitic on *Mimusops hexandra*, Roxb., *Zizyphus Xylopyrus*, Willd. and *Grewia rotundifolia* Willd. Mr. Fischer, in Records of Botanical Survey of India Vol. XI, No. 1, mentions over 100 plants on which *L. longiflorus* is parasitic.

***Ficus tomentosa*, Roxb.**

Plate V-B

A large tree with milky juice. Bark light grey, smooth, with narrow transverse ridges and small corky streaks, exfoliating in round patches about 1 inch across, the scars resulting from the exfoliation giving rise to horizontal depressions as the trunk

grows. Ends of twigs covered with yellowish-brown fur; lower parts glabrous, dark reddish-brown, with longitudinal cracks and elongated corky patches. Leaves alternate; blade up to about 7×4.5 inches, ovate or slightly obovate, base shallowly cordate, apex bluntly apiculate, upper surface glabrous except for curly hairs on and near the base of the midrib and main nerves; under-surface densely tomentose with brownish-yellow hairs; main nerves usually 5 or 6 pairs, straight, not opposite except the lowest pair which join the midrib at the base; gland at the base of the midrib at the back consisting of a roundish, green, sticky-looking patch, sometimes hidden by a tuft of hairs; petioles round, tomentose, up to about 2.75 inches long. Stipules lanceolate, densely hairy on the back, soon falling, .7 inch long. Receptacles sessile, in pairs in leaf axils or at nodes without a leaf, densely tomentose, buff-coloured, 1 cm. across.

Growing between rocks, Tambaram and Vengambakkam Hills. Fruit ripening in March.

Taccaceae

Perennial herbs; rootstock tuberous or creeping. Leaves radical, entire and ribbed, or pinnately lobed or irregularly lobed and penninerved. Flowers 2-sexual, regular, umbelled on a naked scape with an involucre of 2-12 spathaceous bracts and long, filiform bracteoles. Perianth superior, urn-shaped or subcampanulate, 6-lobed in 2 series. Stamens 6, included, on the tube or the base of the perianth-lobes; filaments very short, dilated or laterally appendaged at the base, dilated into a hood above the anthers with 2 ribs or horns on the inner face; anther sessile within the hood. Ovary inferior, 1-celled; ovules many on 3 parietal placentas; style short, included; stigmas 3, often petaloid, broad and 2-lobed, inflexed like an umbrella over the style. Fruit berry-like or at length 3-valved, 3- to 6-ribbed. Seeds numerous, ovoid, striate; albumen hard; embryo minute.

Tacca, Forst.

Characters of the Family, fruit a berry.

Tacca pinnatifida, Forst.

Plates V-C and VI-A

A perennial plant with white roundish tubers a few inches in diameter. Leaves radical, usually one from each tuber; blade up to 2 feet in diameter, 3-partite; in young plants the 2 side lobes are each bilobed and the middle one remains undivided; in older plants each lobe is unequally divided into numerous lobes, some of the lobes being joined only by narrow strips along the ribs; petioles up to 2 feet long cylindrical, tapering, ridged, hollow, green mottled with purple below. Scares up to 37 inches, similar to the petioles, hollow. Inflorescence an umbel of 40-50 flowers; bracts

6, light yellowish-green, 2 outermost larger, broad at the base and tapering to a point, 4 smaller 2 near each sinus between the larger; bractioles thread-like up to 6 inches long, drooping; flowers on lax pedicels up to about 1 inch long. Perianth superior, of 6 lobes alternately broader and narrower; lobes boat-shaped with incurved tips, the tips of the three broader lobes folded one over the other and over these the tips of the three narrow ones are folded, outer surface yellow, wrinkled, inner surface white. Stamens 6; filaments joined to the perianth from the bottom, expanding to a white hood with out-turned edges at about the middle of the perianth lobes; anther attached to the front edge of the hood; pollen grains ovate, about 0.03×0.05 m.m. There are two liver-coloured keels, broader below than above, growing out of the lower half of each perianth lobe and running parallel to the filaments. Ovary one-celled; ovules attached to the cell wall in 3 rows. Style purple, broadly conical and bearing gland-tipped hairs at the base. In the ripening fruit three rounded purplish elevations develop at the base of the style. These are covered with white gland-tipped hairs. Stigma white, consisting of 3 bilobed petal-like parts which spread round the style like an umbrella. Fruit a round yellow berry up to about 1 inch in diameter, with 3 large and 3 smaller ribs, tip carrying the persisting perianth, containing about 25 seeds. Seeds closely packed. Seeds ovoid, somewhat irregularly compressed; about 0.2 inch long, light brown, with about 15 longitudinal ridges.

Growing on shaded tank bunds near Puttur, 2 miles south of Tambaram. Leaves and flowers found in November, fruit in December. The distribution given in F.P.M. is Ganjam, Rampa Hill, Nallamalais and Mysore (Ananthapura). This plant is sometimes cultivated, apparently by hill tribes. Under cultivation the tuber is said to grow to 1 foot in diameter and the leaf to 3 feet in diameter. One of several products called East Indian arrowroot is obtained from the tuber.

The flowers of this peculiar plant do not appear to expand. It appears probable that cross fertilization is brought about by small flies that enter by the apertures between the perianth lobes. The internal structure of the flowers and their faint mushroom-like smell support this suggestion. The drooping thread-like bracteoles probably serve as settling places for the flies.

***Dioscorea oppositifolia*, Linn. var. *Linnaei* Pr. and Burk.**

Plate VI-B

A slender climbing plant with a tuberous root. Tuber light brown, ovoid, with a narrow neck. Stems wiry, unarmed, round, twisted, twining to the right. Leaves changing with the age of the plant. First few leaves alternate, broadly cordate, about 2×2 inches, with two pairs of strongly-marked veins from the base of the mid-rib, darkish green mottled with lighter green and purplish; petioles 1.5 inches, channelled, base clasping the stem, upper

part dilated. Leaves of mature plant lanceolate or narrowly ovate, slightly auricled at base, acute or somewhat acuminate at apex, one pair of prominent nerves arching from base to apex, light green becoming yellowish, leathery; petioles 0.5 inch long, flattened, rather stout, twisted and used for climbing. Male flowers in spikes in leaf axils and fascicled at the ends of branches, sweet-scented, lowest spikes opening first; rachis brown, pubescent; bracts brown, scaly, mucronate; perianth lobes 3 outer and 3 inner, broadly ovate, .05 inch long, pale green; stamens 6. Female flowers in few-flowered branched spikes in leaf axils, rachis pubescent; ovary ovate, triangular in section, with 3 rounded ribs, .25 inch long, light green, glossy, pubescent; perianth superior yellowish-green, of 3 outer hemispherical and 3 less convex inner parts; styles 3; staminodes 6, flattened, arranged at the corners and mid points of sides of an equilateral triangle. Capsule having 3 suborbicular wings, slightly depressed and with a blunt tip at the apex, .6 inch long, 1 inch wide. Seeds discoid, with a membranous wing.

Very common round the base of Vandalur and Vengambakkam Hills, in thickets, climbing over shrubs. Flowers in December and January. Capsules ripen about March. The identification of this plant was kindly confirmed by Mr. I. H. Burkill, the authority on this family.

Cyanotis tuberosa, Schult, f.

Plate VII-A

A perennial herb. Roots tuberous; tubers numerous from a thickened stock, longly spindle-shaped, surface reddish-brown, flesh cellular with a denser centre. Stems round, green, roughly hairy, rooting at the ends or nodes. Radical leaves linear, up to about 1 foot long, the two sides curled together, apex acute, the base forming a tube round the inner leaf bases or stem and covered with long golden hairs, upper surface glabrous, glossy, under surface roughly hairy. Cauline leaves generally only a few inches long; sheaths covered with long hairs, slightly dilated at the base. Flowers in scorpioid cymes. Cymes in upper leaf axils or at ends of branches, 2 to 6 cymes at a node; peduncles .5 inch long or more; bract shorter or not much longer than the inflorescence; bracteoles broadly falcate, in two series, overlapping, roughly hairy. Sepals 3, narrowly lanceolate, with long silky hairs, alternating with corolla lobes. Corolla tube broadly funnel shaped, white; lobes 3, broadly triangular, reddish-purple, tips curved back, thickened and white. Stamens 6; anthers orange-yellow; filaments about twice as long as corolla lobes, inflated near the apex and with a dense beard of mauve hairs. Ovary pale green, pubescent, with 3 vertical ridges along the upper half. Style dilated near the tip and then pointed, with some hairs round the dilated portion but not below. Capsule 3-celled, 6-seeded, without a central column after dehiscence. Seed flat at one end, rounded and with a black disc at the other end, surface warty.

Common in the Tambaram district (College Compound), growing in grassy places and in scrub jungle. Flowers August to March. The flowers are open during the hottest hours of the day, 10—3 (March).

***Cyanotis papilionacea*, Schult, f.**

A small semi-succulent herb. Stem round, erect at first, then branching and spreading along the ground and rooting at the nodes. Leaves lanceolate or oblong, sometimes short and broad, often curved, thick, concave, up to 2.5 inches long, often not more than 1 inch, yellowish-green to reddish, with scattered hairs, tips blunt to sub-acute; petioles clasping the stem, short. Peduncles usually 2 from the end node of each branch, sometimes one also from the next node below, up to about 2 inches long. Bract triangular or cordate, sometimes longer than the cyme, often no longer than the bracteoles. Bracteoles semi-circular, margins ciliate, apex acute, about .3 inch long. Cymes curved, with up to about 20 flowers in a double row. Calyx teeth acute, strongly ciliate. Corolla purple. Filaments purple, extending about .2 inch beyond the corolla tube, dilated to a whitish bulb a little below the anthers, all with a long blue beard along the part below the swelling; anthers orange. Style as long as the anthers, with a whitish bulb at the tip, sparingly bearded; bulb tapering to a point above. Capsule 3-celled with 2 seeds in each cell, valves separating more or less from a central trifold column. Seeds about 1 mm. long, blackish, flat at one end and with a small button-like cap with a short point in the middle at the other surface slightly tuberculate.

Very common at Tambaram in sandy places. Flowers December and January.

***Commelina undulata* R. Br. var. *setosa*, C. B. C.**

A prostrate annual herb. Roots thick, dark brown. Stems numerous, running along the ground, thickened at the base and forming a clump. Leaves linear or narrowly lanceolate, curved, usually less than 3 inches long, rather thick, the two sides folded more or less together, tip acute, margins wavy and reddish, slightly pubescent below, bluish-green; petiole sheathing the stem, dilated and split down one side when branching occurs at the node, reddish, ridged, with bristle-like hairs at the mouth. Spathes with very short peduncles, irregularly funnel-shaped, the two halves pressed together when in flower and gaping when the capsule ripens, up to .7 inch long and .3 inch wide, covered externally with short-hooked hairs and long jointed ones. Flowers about .6 inch across, pale blue. Outer sepal broadly boat-shaped; 2 inner broadly ovate, concave, joined together for about half their length; all white with transparent margins. Two petals large, with kidney-shaped lobes and narrow stipes; third narrowly ovate, small, between the inner calyx lobes. Three stamens reduced to staminodes with short slender filaments and yellow butterfly-shaped sterile anthers; one with a large anther the two curved cells of which are joined at one

end and diverge at the other ; two stamens with small blue sagittate anthers and long blue filaments arching together. Ovary green ; style blue, sigmoidly curved ; stigma a small knob ; the ovary not maturing in a certain proportion of flowers and the style remaining white and coiled. Capsule 3-celled, splitting into 3 valves, with one seed in each cell. Seeds dull black, almost spherical, about .12 inch across, with a broad longitudinal scar, almost completely encircled by a dull grey blister-like band between the ends of which there is a small circular depression with a blunt brown point in the middle.

Common in open grassy places. Tambaram (College Compound). Flowers and sets seed during the rains and until the end of March ; the flowering is over by mid-day. The spathes turn brown and fall when the contained capsule is ripe and, owing to their hooked hairs, they cling to hairy surfaces and are probably dispersed by animals.

There is also at Tambaram and Vandalur what appears to be another form of this plant. It grows in the shade of bushes and trees ; its stem is at first erect but later it straggles over the undergrowth and may attain a length of over 5 feet. Its leaves are linear-lanceolate up to 6 inches by .6 inch. The margins of the leaves appear to be straight and smooth, but are actually minutely serrate. Its spathes, flowers, capsules and seeds are very similar to those described above and it, therefore, appears to be the same species.

C. undulata is in many ways similar to *C. paleata*, Hassk, and has often been confused with it. The latter can be distinguished by its long peduncled spathes which are up to 1.3 inches long, and by its broadly lanceolate leaves. Diagram C on Plate XXXV of the main volume is evidently *C. undulata* var *setosa*, and not *C. paleata*. It is very doubtful whether the latter species occurs in the eastern districts of the Presidency, and it has not been included in the revised key for this genus.

Phoenix farinifera, Roxb.

Plate VII-B

A low shrub. Stem up to 3 feet, usually shorter and hidden by the leaf bases. Leaves numerous, pinnate, usually about 4 feet long ; rachis flattened near the base in the plane of the leaf, at the upper end flattened at right angles, and approximately triangular in the middle ; leaflets about 100, irregularly alternate and standing approximately in 4 rows, mostly at about right angles to the rachis, up to about 11.5 inches long, usually shorter, .6 inch wide, the two sides folded together and usually standing at less than 90° to each other, the folded base attached to the rachis by a prominent yellow pulvinus, apex bearing a sharp spine, both surfaces bright green and glossy, the lowest reduced to short flattened spines. Inflorescences numerous, in the leaf axils, male and female flowers on different plants. Spathes leathery or woody, smooth and finely striated longitudinally, ovate, flattened, with 2 keels ; keels smooth or with a short brownish fringe ; apex flattened.

truncate. Male flowers in branched spikes each inflorescence consisting of about 35 simple spikes each containing 25—30 flowers; main spadix flattened on the inner side and convex on the outer; branches irregular, dilated at the base. Calyx cup-shaped with 3 obtuse teeth alternating with the corolla lobes, cream-coloured. Corolla of 3 thick, ovate, concave, yellowish lobes. Stamens 6; anthers elongated, winged, often all or several joined at the tip; filaments thickened and fused together; pollen copious, white; grains ovoid, about $.01 \times .02$ mm. Female flowers arranged as in male inflorescence but usually with fewer branches and fewer flowers to each spike. Calyx cup-shaped with 3 obtusely keeled teeth. Corolla of 3 greenish-yellow petals closely folded over each other and round the ovary so that only the 3 diverging stigmas are visible. Ovary of 3 compressed but separate carpels; stigmas one to each carpel, curved; staminodes present but flattened and obscure. Berries one-seeded, ovoid, bright red, glossy, with a mucronate tip, the calyx and corolla forming a green scaly cup at the base, about $.7 \times .3$ inch, becoming black when quite ripe; flesh mealy, pleasant-flavoured. Seed oblong, light brown with a deep longitudinal groove, $.5$ inch long.

One of the commonest plants in scrub jungle in the Tambaram district. Flowers December to February. Fruit ripens January to April. Each plant does not appear to flower each year, as at the flowering time numerous mature plants are found without inflorescences. The leaves are used for mat and basket making and the pith of the stem is edible.

Theriophonum, Bl.

Tuberous herbs. Leaves few, cordate, sagittate or hastately 3-lobed; petioles long. Spathe tubular below, slightly constricted at the mouth, limb erect, oblong or lanceolate, acuminate or subcaudate. Spadix included, slender. Male and female flowers well separated. Perianth 0. Stamens 1—2, aggregated in a narrow, cylindric mass 3—5 times longer than the female inflorescence; anthers subsessile, globose, connective thin, sometimes produced. Ovaries usually few, oblong, 1-celled; stigmas sessile; ovules few to many, basal or apical. Neuters below rather long, filiform, upper shortly subulate, uppermost sometimes verrucose. Berries ovoid. Seeds ovoid, erect or pendulous; albumen copious.

Theriophonum minutum, Engl.

A perennial tuberous monoecious plant. Tubers up to 1.75 inches across, white, roundish in young plants, becoming irregular in later stages by partial division into several tubers, up to about 7 inches below ground. Roots long, white, fibrous, emerging from the base of the stem above the tubers. Leaves radical; blade up to 4×5 inches, very

variable in shape from broadly cordate to narrowly hastate, usually ovate with a triangular or ovate lobe on each side at the base, upper surface darkish green with a waxy lustre, under surface lighter, glossy; petioles up to 14 inches long, channelled, part below ground white. Inflorescence solitary. Peduncle slender, the upper end just above the ground. Spathe up to 5.5 inches long, constricted between tube and limb and purple at the constriction on the inner surface; tube irregularly oval, having a somewhat dilated base at the back and being somewhat flattened in front, pale-green; limb erect, boat-shaped to broadly ovate, very pale green, not striated, margins finely frilled and deep reddish-purple, apex acute. Spadix up to about 3 inches long, straight, not exerted from the spathe; flowers without perianth; females at the base, up to about 17; after a short bare space there is a group of up to 30 long neuters; above these about .7 inch covered with males; then .25 inch covered with short neuters, and finally an appendage about 1.5 inches long, dimensions smaller in most specimens. Ovary green, flattened; stigmas white, tufted, as wide as ovaries. Long neuters purple, filiform, .25 inch long, tips blunt and turned upwards. Males with short curved purple beaks, all shedding their pollen on the same day. Pollen yellow, grains spherical. Short neuters filiform, about 1/10 the length of the long ones. Appendage deep purple, enlarging at the base from the narrow fertile part of the spadix, tapering to a blunt tip. Berries purplish-black above, white at the base, containing up to 9 seeds but little or no pulp. Seeds attached to both top and bottom of the cell, lemon-shaped, longitudinally ridged, ridges dark green, grooves brown, tip white.

Common in shady and damp places, such as tank bunds, near Tambaram; also under trees and shrubs in scrub jungle at Vandalur. Flowers during the rains (November and December). Fruits in December and January.

The plant described on page 300 of the Flora of Madras City as *Typhonium divarcatum*, Decne. and depicted in drawing C on Plate XXXVII is *Theriophonum minutum*. In F.P.M., *Typhonium divarcatum* is described as occurring on the E. Coast but as not being common. The writer has not found it near Madras, but has found it to be common near Trivandrum.

Theriophonum Wightii, Schott.

A perennial tuberous herb. Leaves radical, very narrowly hastate; midlobe up to about 4.5 inches long and .25 inch wide; side lobes up to 2 inches long, narrower than the central lobe. Spathe up to about 5 inches long, pale greenish-yellow, margin of limb purple, waved. Spadix shorter than the spathe. Female flowers about 11, at the base of the spadix; ovaries light green, spherical; stigmas yellowish, tufted, sessile. Above the females there is a bare area of the spadix about .12 inch long, then about .25 inch bearing filiform bluntly-pointed brownish-purple neuters about .25 inch long, then about .4 inch bearing dark purple shortly-beaked males, then, after a short bare space, about

.25 inch bearing numerous short neuters (about .03 inch long), and finally a narrowly conical appendage about .8 inch long. The appendage is somewhat verrucose at the base. When the spathe opens the appendage is liver-coloured but it becomes dark grey at a later stage. Berries and seeds as in *T. minutum*.

Tambaram and Puttur. Flowering November to January. The identification of specimens of this plant from Tambaram was confirmed by Kew. A careful comparison of living specimens of the inflorescence of this plant with that of *T. minutum* showed them to be essentially identical. The only differences observed were that in *T. minutum* the brownish-purple band on the inside of the spathe at the constriction between the tube and the limb was more strongly marked, and in *T. Wightii* the anthers were more definitely beaked than in *T. minutum*. The berries and seeds of these two plants appear to be indistinguishable. Leaf shape therefore appears to be the only distinction between these species, and as leaves varying considerably in shape are often found on the same plant in *T. minutum*, it appears to be doubtful whether these two plants should be regarded as specifically different.

Amorphophallus sylvaticus, Kunth

Plate, VII-C

A tuberous perennial plant. Tuber up to 5 inches across, globose, flattened. Roots emerging from the upper side of the tuber round the scape or petiole. Irregular fleshy underground stems emerging from the tuber and forming buds which develop into small tubers on the underside of the stem. Not more than one leaf formed at the same time. Leaves varying with the age of the plant; first leaf produced having 5 ovate lobes palmately arranged one in the middle on a short petiolule and 2 at each side on common petiolules; the next leaf having the lowest side-lobes on each side divided into two almost to the base and sometimes the midlobe more or less divided into two; subsequent leave becoming more and more complex, the latest having upwards of 50 lobes variously attached by the three branches at the base; each lobe having a central rib and a number of pinnately arranged nerves each of which arches upwards and joins the nerve above forming an intramarginal nerve; tips of lobes acute or shortly cuspidate; upper surface darkish green; under side lighter, glossy; petiole solid, succulent, mottled. Inflorescence solitary, the same plant not producing a leaf the same season. Peduncle cylindrical, smooth, up to 18 inches long, strongly mottled with olive-green or brown on a white, light pink or light grey ground. Spathe campanulate with a short triangular limb, one edge overlapping the other, up to about 2.5 inches long, outer surface almost white with dull green patches and numerous parallel nerves, inner surface dark purple below becoming lighter above. Spadix cylindrical, long exserted from the spathe; lowest .7 inch covered

with female flowers consisting of bright green ovaries with short styles and large yellow bilobed sticky stigmas ; next .5 inch covered with flat diamond-shaped neuters, purple in early stages, later becoming yellow or white ; above these 1.5 to 2 inches covered with male flowers consisting of irregular groups of 3 to 5 roundish bodies (anthers) varying in colour from black to purple or brown ; anthers opening by pores in sides ; pollen grains spherical ; appendage tapering to a blunt tip, about 8 inches long, purple, light brown or bright yellow with a sticky lustre, somewhat warty or wrinkled. Ripening peduncle with up to 100 berries ; berries ovoid .5 inch long, scarlet, glossy, usually 2-seeded. Seeds semi-ovoid, purplish or brownish-green, flesh white.

Common in a few restricted areas near Tambaram—Irumbuliyur tank bund, tank bund near Nedunkundram. Flowers in August. Berries ripen in November and December. Leaves found throughout the cooler and moister months. This plant has not previously been reported from this part of the Presidency. The inflorescence has a strong offensive smell like that of certain bugs.

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PLATE I.

- A. *Rhynchosia rufescens*, DC. $\times 1/2$.
- B. *Rhynchosia suaveolens*, DC. $\times 1/2$.
- C. *Pterocarpus Marsupium*, Roxb.
 - 1. Twig with two leaves $\times 1/2$.
 - 2. Pods $\times 1/2$.



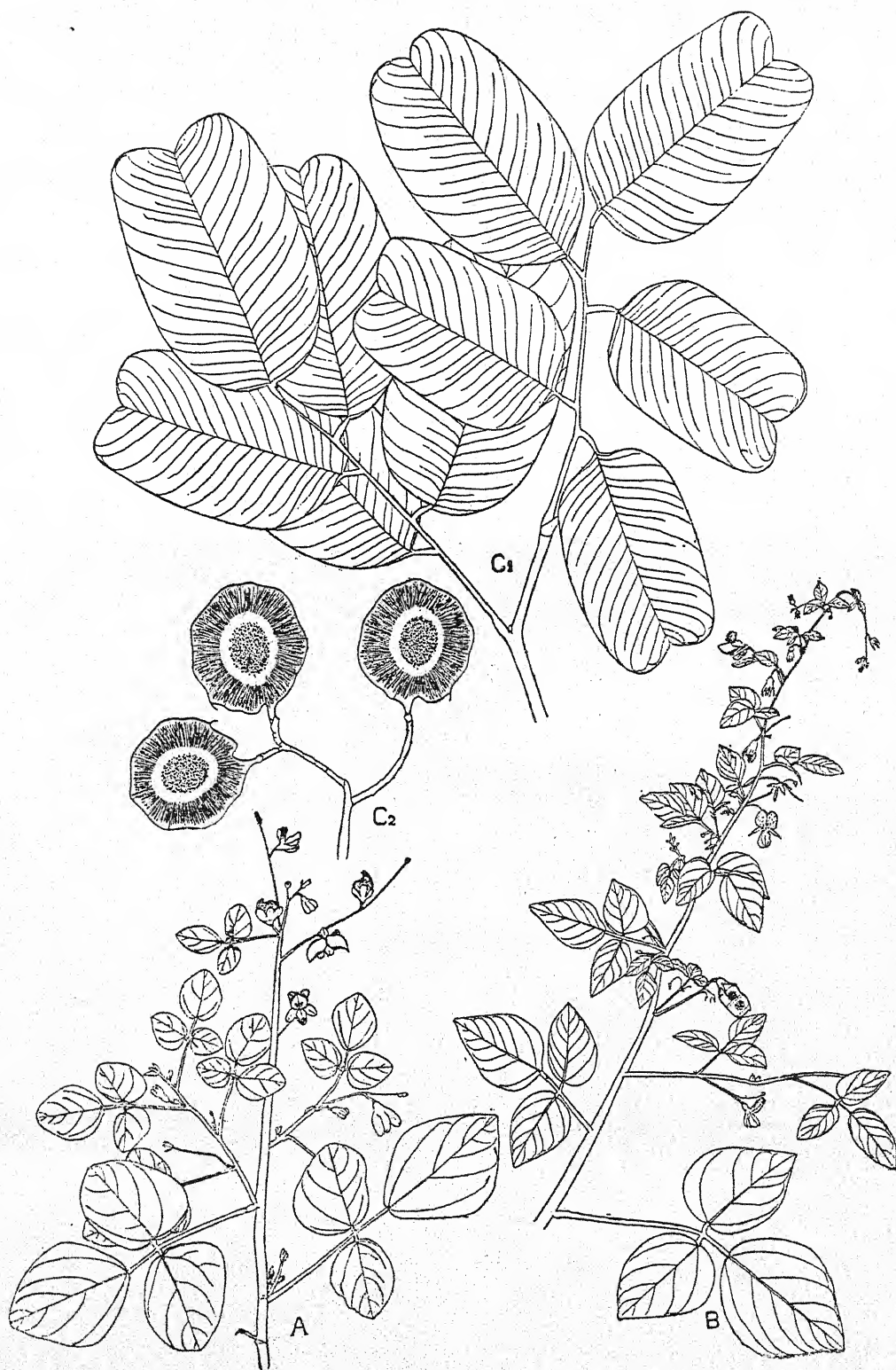


PLATE II.

- A. *Anogeissus latifolia*, Wall, $\times 1/2$.
- B. *Epaltes pygmæa*, DC. $\times 1$.
- C. *Diospyros Ebenum*, Koen.
 - 1. Branchlet of female plant $\times 1/3$.
 - 2. Female flower $\times 1$.
 - 3. Branchlet of male plant $\times 1/3$.
 - 4. Cyme with male flowers $\times 1$.
- D. *Hoppea dichotoma*, Willd.
 - 1. Whole plant $\times 2/3$.
 - 2. Cyme $\times 6$.





PLATE III.

- A. *Limnophila polystachya*, Benth $\times 1/4$.
- B. *Limnophila racemosa*, Benth.
 - 1. Whole plant $\times 1/6$.
 - 2, 3, 4, 5. Stages in the variation of the
leaves on passing up the stem $\times 1/2$.
 - 6. Flower $\times 2/3$.
 - 7. Capsule $\times 2/3$.
- C. *Centranthera humifusa*, Wall.
 - 1. Whole plant $\times 1/2$.
 - 2. Opened corolla tube $\times 2$.
- D. *Utricularia stricticaulis*, Stapf $\times 1$.
- E. *Utricularia Wallichiana*, Wt. $\times 1$.

PLATE IV.

- A. *Dolichandrone falcata*, Seem.
1. Twig with capsule $\times 1/3$.
2. Seed $\times 1/2$.
B. *Andrographis elongata*, T. And.
1. Branch $\times 1/3$.
2. Capsule $\times 1$.
C. *Barleria longiflora*, Linn. f. $\times 1/2$.
D. *Vitex altissima*, Linn. f. $\times 1/4$.

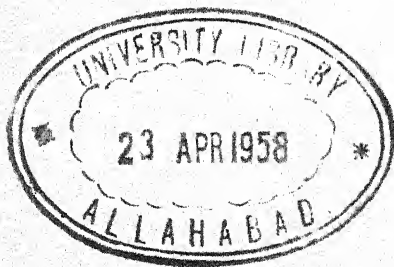




PLATE V.

- A. *Loranthus longiflorus*, Desv. $\times 12$.
- B. *Ficus tomentosa*, Roxb. $\times 1/3$.
- C. *Tacca pinnatifida*, Forst.
 - 1. Inflorescence $\times 1/2$.
 - 2. Seed $\times 2$.

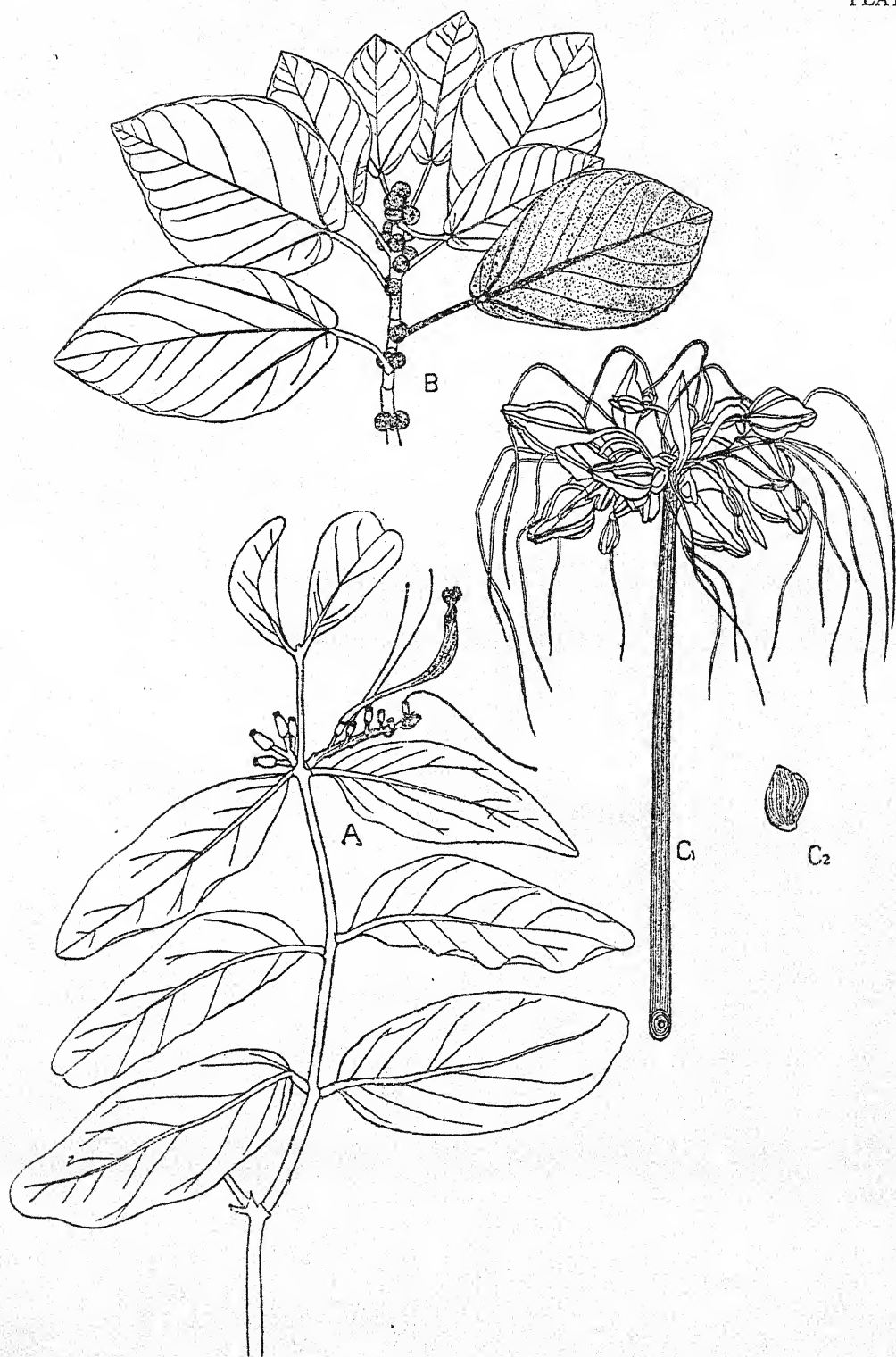


PLATE VI.

A. *Tacca pinnatifida*, Forst.

1. Leaf of young plant $\times 1/2$.
2. Tuber $\times 1/3$.

B. *Dioscorea oppositifolia*, Linn.

1. Tuber with first leaves $\times 1/2$.
2. Spray of female plant $\times 1/3$.
3. Spray of male plant $\times 1/3$.





PLATE VII.

- A. *Cyanotis tuberosa*, Schult f.
- B. *Phœnix farinifera*, Roxb.
 - 1. Male inflorescence $\times 1/2$.
 - 2. Base of leaf $\times 1/3$.
- C. *Amorphophallus sylvaticus*, Kunth
 - 1. Tuber and leaf $\times 1/4$.
 - 2. Portion of leaf showing venation $\times 1/2$.
 - 3. Inflorescence $\times 1/2$.

